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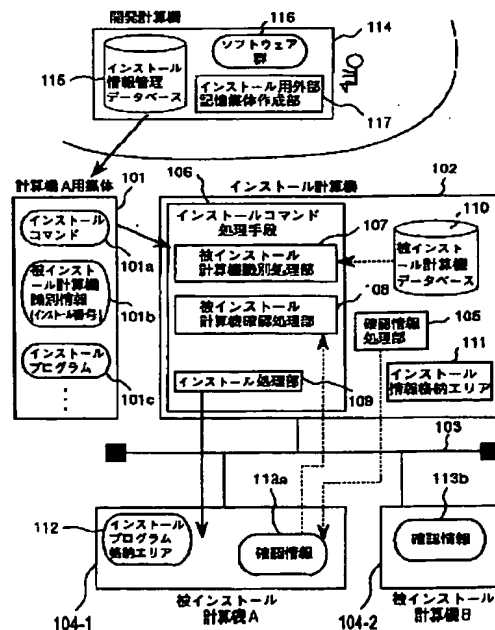
(54) 【発明の名称】 ソフトウェアのインストール方法及びその計算機システム

(57) 【要約】

【課題】複数の計算機の中からインストール対象を正しく識別して、ソフトウェアの誤インストールを防止する。

【解決手段】インストール用記憶媒体101に、インストール先を識別するためのインストール番号101bを格納しておく。インストール計算機102は、記憶媒体101からインストール番号を読み出し、自己が管理している被インストール計算機データベース110から、該当するインストール番号とその計算機アドレス（ネットワークアドレス）を取り出す。次に、そのアドレスの計算機から確認情報113aを読み出し、インストール番号101bと一致するときに、プログラム101cのインストール作業を開始する。

図 1



【特許請求の範囲】

【請求項1】 対象の計算機を特定して、ソフトウェアをインストールする方法において、前記ソフトウェアと、そのインストール先を一意に示す識別情報（例えば、インストール番号）を一体的に管理し、前記ソフトウェアのインストールに際し、まず前記識別情報を取り出し、その識別情報に対応する被インストール計算機を識別し、その計算機のアドレス先から予め記憶している確認情報を取り出し、前記識別情報と前記確認情報が一致するときにインストールを開始することを特徴とするソフトウェアのインストール方法。

【請求項2】 請求項1において、前記確認情報は、その被インストール計算機に設定されている前記識別情報を暗号化した情報であり、その復号化を通して前記ソフトウェアと一体的に管理されている識別情報との一致を確認することを特徴とするソフトウェアのインストール方法。

【請求項3】 インストール計算機と、ネットワークで結ばれた複数の被インストール計算機を備え、対象の計算機にソフトウェアをインストールする計算機システムにおいて、前記ソフトウェアと、そのインストール先を一意に示す識別情報（例えば、インストール番号）を一体的に記憶するインストール情報記憶手段と、前記識別情報毎に、対応する被インストール計算機のアドレスを管理する被インストール計算機データベースと、前記被インストール計算機に含まれ、各々に前記インストール計算機から設定された確認情報を記憶する確認情報記憶手段と、前記インストール計算機に含まれ、インストール対象の識別情報を前記インストール情報記憶手段から読み出し、その識別情報と同じ識別情報で管理されている被インストール計算機のアドレスを前記被インストール計算機データベースから抽出し、そのアドレスの被インストール計算機から読出した確認情報と当該識別情報との一致を確認する被インストール計算機識別・確認手段と、一致したときに前記インストール情報記憶手段に記憶するソフトウェアを当該被インストール計算機にダウンロードするインストール処理手段と、を設けたことを特徴とする計算機システム。

【請求項4】 請求項3において、前記インストール情報記憶手段は、インストールに際して前記インストール計算機にセットされる外部記憶媒体からなり、前記被インストール計算機識別・確認手段の機能は、前記外部記憶媒体に格納されているインストールコマンドを前記インストール計算機が読み出して実現することを特徴とする計算機システム。

【請求項5】 対象の計算機を特定し、バージョンアップしたプログラムを含む新版のソフトウェアを、稼働中のプログラムを含む現版のソフトウェアと取り替えるソフトウェアのインストール方法において、前記ソフトウェアと、そのインストール先を一意に示す識別情報（例えば、インストール番号）と、自バージョンと対応バージョンによる対応履歴情報とを含むインストール情報を、前記新版及び前記現版について管理して

10 前記ソフトウェアのインストールに先立ち、前記新版及び前記現版のインストール情報から各々の対応履歴情報を読み出し、互いの自バージョンが相手の対応バージョンとなる対応関係を確認し、また、前記新版の識別情報を取り出して対応する被インストール計算機の識別を行った後に、当該被インストール計算機に前記新版のソフトウェアをインストールすることを特徴とするソフトウェアのインストール方法。

【請求項6】 インストール計算機と、ネットワークで結ばれた複数の被インストール計算機を備え、対象の計算機の稼働中の現版のソフトウェアとバージョンアップした新版のソフトウェアを取り替え可能に構成した計算機システムにおいて、

前記ソフトウェア、そのインストール先を一意に示すインストール番号及び自バージョンと対応バージョンによる対応履歴情報を含むインストール情報を格納している新版用外部記憶媒体と、前記インストール番号毎に対応する被インストール計算機のアドレスを管理するデータベースと、前記新版用外部記憶媒体からインストール番号を読み出し、前記データベースから該当する被インストール計算機を識別し、その被インストール計算機から取り込んだ識別情報を確認する手段と、インストール番号と識別情報の一致が確認された被インストール計算機に前記ソフトウェアをインストールする手段を具備する前記インストール計算機と、前記確認情報として暗号化したインストール番号を記憶する手段と、インストールされたソフトウェアを格納する手段を具備する前記被インストール計算機を有し、インストール用の外部記憶媒体の情報から、被インストール計算機を識別、確認してソフトウェアのインストールを行なうように構成したことを特徴とする計算機システム。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、分散配置された計算機のソフトウェアインストール方式に関する。

【0002】

【従来の技術】 従来のソフトウェアインストール技術として、特開平5-108317号公報に記載されている方法が知られている。その実施例4では、複数の計算機

がネットワーク接続されたシステムにおいて、特定の計算機にプログラムをインストールする際に、対象外計算機への誤インストールを防止するために、オペレーターからホスト名称を指定させ、そのホスト名称の計算機に格納されているサイト番号をインストール計算機に取り込み、提供媒体内のサイト番号と比較することにより、インストール対象計算機の識別を実現している。

【0003】また、引用例の実施例2では、インストール終了後に、プログラム入れ替え前の状態に戻す（復旧）機能を開示している。この機能は、インストール対象計算機に旧プログラム格納エリアを設け、そこに旧プログラムを退避しておくことで実現している。

【0004】

【発明が解決しようとする課題】上記引用例の実施例4の方法では、オペレーターがインストール先のホスト名称を知らないとインストール作業ができない。あるいは、オペレーターがホスト名称の入力を誤るとインストール作業が失敗する。

【0005】さらに、インストール対象計算機のサイト番号を格納しているファイルのサイト番号を、エディター使用によって他の計算機のサイト番号に書き換えられ、さらにネットワークアドレスとホスト名称を格納するファイルの内容を書き換えられる恐れがある。この場合は、正しいホスト名称を入力しても被インストール計算機を誤ることになる。

【0006】また、上記引用例の実施例2の方法では、旧プログラムを退避しておくエリアを常に確保しておく必要がある。また、旧プログラム格納エリアに格納しているプログラムの内容が破壊や改竄を受ける可能性があり、確実に復旧できる保証がない。

【0007】本発明の目的は、従来技術の問題点に鑑み、オペレーションミスによるインストール作業の失敗がなく、対象の計算機に確実にインストールできるソフトウェアインストール方式及び、インストール計算機と分散した複数の被インストール計算機をネットワークで結ぶ計算機システムを提供することにある。

【0008】本発明の目的は、入れ替えに用いる提供媒体内の内容が改竄を受けている恐れのある場合は、インストールを中止して誤インストールを回避するインストール方式を提供することにある。

【0009】本発明の目的は、インストール計算機と分散された複数の被インストール計算機をネットワークで結び、本発明のインストール方式を適用する信頼性の高い計算機システムを提供することにある。

【0010】本発明の他の目的は、入れ替えたプログラムの起動に失敗した場合、入れ替え前の状態に確実に復旧する計算機システムを提供することにある。

【0011】

【課題を解決するための手段】上記目的は、対象の計算機を特定して、ソフトウェアをインストールする方法に

において、前記ソフトウェアと、そのインストール先を一意に示す識別情報（例えば、インストール番号）を一体的に管理し、前記ソフトウェアのインストールに際し、まず前記識別情報を取り出し、その識別情報に対応する被インストール計算機を識別し、その計算機のアドレス先から予め記憶している確認情報を取り出し、前記識別情報と前記確認情報が一致するときにインストールを開始することにより達成される。

【0012】前記確認情報は、その被インストール計算機に設定されている前記識別情報を暗号化した情報であり、その復号化を通して前記ソフトウェアと一体的に管理されている識別情報との一致を確認することを特徴とする。

【0013】上記目的は、インストール計算機と、ネットワークで結ばれた複数の被インストール計算機を備え、対象の計算機にソフトウェアをインストールする計算機システムにおいて、前記ソフトウェアと、そのインストール先を一意に示す識別情報を一体的に記憶するインストール情報記憶手段と、前記識別情報毎に、対応する被インストール計算機のアドレスを管理する被インストール計算機データベースと、前記被インストール計算機に含まれ、各々に前記インストール計算機から設定された確認情報を記憶する確認情報記憶手段と、前記インストール計算機に含まれ、インストール対象の識別情報を前記インストール情報記憶手段から読み出し、その識別情報と同じ識別情報で管理されている被インストール計算機のアドレスを前記被インストール計算機データベースから抽出し、そのアドレスの被インストール計算機から読出した確認情報と当該識別情報との一致を確認する被インストール計算機識別・確認手段と、一致したときに前記インストール情報記憶手段に記憶するソフトウェアを当該被インストール計算機にダウンロードするインストール処理手段と、を設けたことにより達成される。

【0014】前記インストール情報記憶手段は、外部記憶媒体からなり、インストールに際して前記インストール計算機にセットされる。なお、外部記憶媒体によらずに、開発計算機からインストール情報を転送したり、インストール計算機が開発計算機を兼ねることも可能である。

【0015】前記被インストール計算機識別・確認手段の機能は、前記外部記憶媒体に格納されているインストールコマンドを前記インストール計算機が読み出して実現することを特徴とする。

【0016】本発明の他の目的は、対象の計算機を特定し、バージョンアップしたプログラムを含む新版のソフトウェアを、稼働中のプログラムを含む現版のソフトウェアと取り替えるソフトウェアのインストール方法において、前記ソフトウェアと、そのインストール先を一意に示す識別情報と、自バージョンと対応バージョンによ

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る対応履歴情報とを含むインストール情報を、前記新版及び前記現版について管理していて、前記ソフトウェアのインストールに先立ち、前記新版及び前記現版のインストール情報から各々の対応履歴情報を読み出し、互いの自バージョンが相手の対応バージョンとなる対応関係を確認し、また、前記新版の識別情報を取り出して対応する被インストール計算機の識別を行なった後に、当該被インストール計算機に前記新版のソフトウェアをインストールすることにより達成される。なお、前記バージョンアップには、本来の機能更新だけでなく、部分改訂のレビジョンアップも含む。

【0017】前記インストールの終了後に、前記新版のソフトウェアによる起動を行ない、起動が失敗した場合は、前記現版のソフトウェアによる復旧のインストールを行なうことを特徴とする。

【0018】そのため、前記対応関係が確認され場合に、前記現版のソフトウェアをインストール計算機または被インストール計算機に一時記憶し、前記新版のソフトウェアのインストールによる起動が失敗した場合に、一時記憶してある現版のソフトウェアで直ちに復旧することを特徴とする。

【0019】

【発明の実施の形態】以下、本発明の実施形態について、実施形態1〜3を通して詳細に説明する。

【0020】〔実施形態1〕図1に、本発明の一実施例による計算機システムの構成を示す。本システムは、ソフトウェアのインストールを管理するインストール計算機102と、インストールされたソフトウェアによって実際の業務を遂行する被インストール計算機104-1、104-2と、これら各計算機を接続するネットワーク103から構成されている。なお、インストール計算機102が、インストール管理と実際の業務に兼用されることも可能である。

【0021】本実施形態では、ソフトウェアのバージョン・レビジョンの管理、変更履歴の管理、計算機を識別するための名称管理などを集中して行う開発計算機114はオンラインの外にあり、インストール計算機102は開発計算機114の成果物であるソフトウェアの記憶媒体101から必要な情報を取り込む。もちろん、開発計算機114をネットワークに接続し、インストール計算機102がオンラインで情報を取り込む構成も可能である。

【0022】本発明は特に、インストール対象の多数の計算機が分散配置されているシステムにおいて好適である。以下では、被インストール計算機A104-1に対するインストールについて説明することにするが、被インストール計算機B104-2など、他の計算機においても同様である。

【0023】開発計算機114は、インストール情報管理データベース115と、被インストール計算機にイン

ストールするソフトウェア群117を有し、ソースファイルの作成または修正と、そのコンパイルと、被インストール計算機毎に専用（ここでは、被インストール計算機A）のインストールソフトウェアの記憶媒体101の作成を行う。

【0024】被インストール計算機A用の記憶媒体A101には、インストールコマンド101a、被インストール計算機の識別情報（インストール番号）101b、インストールプログラム101cなどを格納している。

【0025】図2に、インストール用外部記憶媒体のデータ構成を示す。インストール用外部記憶媒体101には、インストールコマンド101a、インストール番号101b、インストール用プログラム101c-1、101c-2、...を格納している。また、自バージョン番号101d、対応媒体バージョン番号101e、メンバファイル101f等を記憶している。これらデータ内容はインストール対象ごとに異なる。

【0026】インストールコマンド101aは、被インストール計算機を決定し、プログラムのローディング、被インストール計算機へのダウンロード、新プログラムへの切り替えという一連のインストール作業を行うためのもので、インストール作業の最初に、インストール計算機にローディングされる。

【0027】インストール番号は、被インストール計算機の識別情報であり、外部記憶媒体Aのインストール先である被インストール計算機Aを示す。外部記憶媒体Aのインストール番号と被インストール計算機Aのインストール番号が一致したときに、被インストール計算機Aにインストールが行なわれる。

【0028】インストール対象プログラム101c-1、2、...は、インストール作業で入れ替える被インストール計算機に必要な分だけのプログラムである。メンバファイル101fは、記憶媒体101に含まれるインストール対象プログラムの名称とサイズを格納している。自バージョン番号101d及び、対象記憶媒体バージョン番号101eについては後述する。

【0029】インストール計算機102は、被インストール計算機識別処理部107、被インストール計算機確認処理部108及びインストール処理部109を含むインストールコマンド処理手段106と、被インストール計算機データベース111と、インストール情報格納エリア112を有している。さらに、エントリのある計算機に付与されるインストール番号301を暗号化して確認情報301'を生成し、対応する計算機のファイルに格納する確認情報処理部105を有している。

【0030】被インストール計算機A104は、インストール計算機102から設定される確認情報103'を記憶する確認情報ファイル113aと、インストール操作によって格納されるインストールプログラム格納エリア114を有している。ちなみに、被インストール計算

機B104-2は、被インストール計算機B用の機確認情報103'を記憶する確認情報ファイル113bを有している。

【0031】図3は、インストール計算機による被インストール計算機の識別と確認の処理を示すフローチャートである。インストール計算機102は、インストール用外部記憶媒体A101からインストールコマンド101aを取り出す。以降の処理はこのインストールコマンドに従って行なわれる。

【0032】まず、記憶媒体A101からインストール番号101bを、インストール情報格納エリア111に取り出し(S101)、このインストール番号101bと一致するエントリを被インストール計算機データベース110から選択し、そのエントリの計算機アドレス(ネットワークアドレス)を取り出す(S102)。ここまでが、被インストール計算機識別処理部107の機能として行なわれる。

【0033】図4に、被インストール計算機データベースのデータ構成と、インストール番号とその暗号化の例を示す。同図(a)のように、被インストール計算機データベース110には、被インストール計算機としてエントリしている計算機を識別するために、システム内で一意に付与されたインストール番号301と、その計算機のネットワークアドレス302が登録されている。

【0034】次に、インストール計算機102からインストール番号の一致した被インストール計算機104のネットワークアドレスにアクセスし、被インストール計算機104の確認情報ファイル113aから確認情報301'を読み出す(S103)。確認情報301'は、図4(b)に示すように、インストール計算機102にエントリしている計算機のインストール番号301を暗号化して記憶している。

【0035】そこで、確認情報301'を復号化し(S104)、記憶媒体A101から取り込んだインストール番号101bと一致するか比較する(S105)。この比較の結果を確認し(S106)、一致していれば、以上の被インストール計算機確認処理を終了し、インストール処理部109によるプログラム101cのインストールを開始する。一方、結果が一致していなければ、エラーメッセージを出力してインストールを中止する(S107)。

【0036】図5に、インストール番号の暗号化と復号化の処理の一例を示す。インストール計算機102は、被インストールをエントリする計算機Aを、被インストール計算機データベース110に、インストール番号301を付与して登録するとともに、確認情報処理部105によりインストール番号301を暗号化し、確認情報301'として計算機Aの確認情報ファイル113aに設定する。

【0037】図5(a)の暗号化処理フローに示すよう

に、インストール番号、例えば「110101」を上位「110」と下位「101」に分け(S201)、各々の数値について同桁の暗号化キーでビット毎の排他論理和XORをとり(S202)、その演算結果をそれぞれ左に1ビットシフトする(S203)。このS202、S203を、ラウンド数分だけ繰り返したのち(S204)、上位と下位を逆につなぎ合わせる(S205)。【0038】この結果、インストール番号301が「110101」、暗号化キーが100、ラウンド数が5の場合は、暗号化した確認情報値301'は「010100」となる。

【0039】次に、確認情報の復号化処理を説明する。この処理は、被インストール計算機確認処理部108又は、そこから呼び出される確認情報処理部105が行なう。図5(b)に示すように、復号化は暗号化と逆向きに処理する。まず、確認情報ファイル113aから読み出した識別情報値301'「010100」を上位と下位に分割し(S206)、それぞれを右に1ビットシフトする(S207)。次に、シフトした分割数値を暗号化処理と同じ暗号化キーでビット毎にXOR演算を行う(S208)。この処理をラウンド数分繰り返し(S209)、最後に、求められた上位値と下位値を逆につなぎ合わせる(S210)。これによって、識別情報は301'は暗号化前のインストール番号301に復元される。

【0040】以上のように、インストール番号は、被インストール計算機を本システムに追加するタイミングでシステム内でユニークに定め、開発計算機114の被インストール計算機情報管理データベース115に登録する。インストール番号の暗号化と復号化は、非公開の暗号化キーを管理するインストール計算機102の専権事項となる。

【0041】開発計算機114は、対象計算機用に開発または修正したプログラムを格納する記憶媒体101を発行する際に、被インストール計算機情報管理データベース115から対象計算機に付与されているインストール番号を取り出し、記憶媒体101のヘッダに記憶する。

【0042】本実施形態によれば、インストールに先立ち、インストール用プログラムを提供する記憶媒体からインストール番号を読み出し、そのインストール番号に対応する計算機のアドレスを取り出してアクセスし、その計算機から読み出した暗号化されている確認情報を復号化し、記憶媒体のインストール番号と一致するとき、当該計算機に対するインストール作業を開始するので、被インストール計算機の確認作業が自動化でき、オペレーションミス等による誤インストールを防止できる。

【0043】また、各計算機に格納されるインストール番号は暗号化された確認情報を用いるので、仮に被イン

ストール計算機側の処理中に改竄が発生した場合は、インストール計算機側でそれを検出することができ、誤インストール防止の処置をとるので、システムの信頼性を向上できる。

【0044】〔実施形態2〕実施形態2におけるシステム構成や記憶媒体のデータ構成は、実施形態1で説明した図1や図2のものとは基本的には同じである。以下では、インストール計算機によるインストール機能について、実施形態1との相違点を中心に説明する。

【0045】図6に、実施形態2によるインストール処理のフロー図を示す。まず、新バージョンのプログラムを格納している外部記憶媒体A101-1及び、対象計算機の現在バージョンを復旧バージョンとして格納している外部記憶媒体A101-2について、正しい組み合わせの外部記憶媒体が用意されているか、外部記憶媒体の確認処理を行なう（S301）。この確認作業は、インストールに失敗した場合の復旧に備えるため、新版と復旧版の2つの記憶媒体をインストール計算機102にセットして行なう。

【0046】ここで、自バージョン番号101dは、インストール用外部記憶媒体に格納されているソフトウェア群のバージョン・レビジョン番号を示す。また、対応記憶媒体バージョン番号101eは、当該外部記憶媒体と対応関係にある外部記憶媒体のバージョン・レビジョン番号を示す。従って、当該外部記憶媒体が新バージョンであれば、その対応記憶媒体バージョン番号101eは復旧バージョンのバージョン・レビジョン番号である。反対に、当該外部記憶媒体が復旧バージョンであれば、その対応記憶媒体バージョン番号101eは新バージョンのバージョン・レビジョン番号である。

【0047】図7に、外部記憶媒体の確認処理の流れを示す。インストール計算機102は、まず、新・旧のインストール用外部記憶媒体101-1、101-2から、各々のインストール番号101b、自バージョン番号101d、対応媒体バージョン番号101eをそれぞれ読み出し、インストール情報格納エリア111に記憶する（S3011）。

【0048】次に、新バージョン格納外部記憶媒体101-1から取り込んだインストール番号101b-1と、復旧バージョン格納外部記憶媒体101-2から取り込んだインストール番号101b-2を比較する（S3012）。両者が一致したかを確認し（S3013）、一致していない場合は、エラーメッセージを出力して、インストールを中止する（S3018）。

【0049】一致している場合は、新バージョン格納外部記憶媒体101-1から取り込んだ自バージョン番号101c-1と、復旧バージョン格納外部記憶媒体101-2から取り込んだ対応媒体バージョン番号101e-2を比較し（S3014）、一致するかを確認する（S3015）。一致しなかった場合は、エラーメッセ

ージを出力してインストールを中止する。

【0050】一致している場合は、新バージョン格納外部記憶媒体101-1から取り込んだ対応媒体バージョン番号101e-1と、復旧バージョン格納外部記憶媒体101-2から取り込んだ自バージョン番号101c-2を比較し（S3016）、一致するかを確認する（S3017）。この結果、全て一致していれば、新バージョン格納外部記憶媒体101-1と復旧バージョン格納外部記憶媒体101-2の正しい組み合わせが確認できたので、この確認処理を終了する。一致しなかった場合は、新・復旧記憶媒体の組合せが不適当であることを示すエラーメッセージを出力し、以後のインストール処理を中止する。

【0051】新・復旧のインストール用外部記憶媒体の確認が正常に終了すると、再び図6の処理に戻り、新バージョン格納外部記憶媒体A101-1のインストール番号101bを用い、被インストール計算機104の識別、確認処理を行なう（S302）。この処理は実施形態1で説明したS101～S106と同じになる。

【0052】次に、新バージョン格納外部記憶媒体A101-1からインストール計算機102の新プログラム用ワークエリアに、インストール対象のプログラム101c-1、2、... がローディングされる（S303）。

【0053】なお、インストール用外部記憶媒体101が複数個の場合も、外部記憶媒体を連続してセットするローディングが可能である。即ち、メンバファイル101fに記憶しているインストール対象プログラムの名称とサイズを基に、ローディングした個々のプログラムのサイズをチェックし、新プログラムが全て正しくローディングされたかの確認が行なわれる。

【0054】次に、復旧バージョン格納外部記憶媒体101-2から、インストール対象プログラムがインストール計算機102の復旧プログラム用ワークエリアにローディングされる（S304）。ここでも復旧プログラムが正しくローディングされたか、メンバファイル101fとを比較することによって確認する。

【0055】次に、インストール計算機の復旧プログラム用ワークエリアにローディングされたプログラムを、ネットワーク103を介して被インストール計算機104の復旧プログラム用ワークエリアにダウンロードする（S305）。

【0056】次に、ダウンロードしたプログラムが、被インストール計算機104で稼働中のプログラムと同じであることを、プログラムオブジェクトの比較により確認する（S306）。

【0057】ダウンロードした復旧プログラムと、被インストール計算機104の稼働中のプログラムの同一が確認されると、インストール計算機102の新プログラム用ワークエリアから、新プログラムをネットワークを

介して、被インストール計算機104の新プログラム用ワークエリアへダウンロードする(S307)。ここで、新プログラムが正しくダウンロードされたか、ダウンロードした個々のプログラムのサイズを比較することによって確認する(S308)。

【0058】新プログラムの正常なダウンロードが確認できた後、現在稼働しているプログラムを停止し、新プログラムを起動するための切り替え処理を行う(S309)。即ち、インストールプログラム格納エリア114の現プログラムを消去して、新プログラムを格納する。

【0059】次に、新プログラムによる被インストール計算機104の起動処理を行ない(S310)、起動が成功したか失敗したか、切り換え結果の確認を行なう

(S311)。換えた新プログラムによる被インストール計算機104の起動が成功すれば、被インストール計算機の旧プログラム用ワークエリア内のプログラム及び、インストール計算機内の新・旧プログラム用ワークエリア内のプログラムを消去し、インストール操作を終了する。一方、起動が失敗した場合は、新プログラムに不具合があるとみて、復旧処理に移行する(S312)。即ち、起動を停止し、被インストール計算機のインストールプログラム格納エリア114の新プログラムを消去し、旧プログラム用ワークエリア内の現プログラムを格納する。

【0060】本実施形態によれば、新版と復旧版の記憶媒体を用意し、その正しい組み合わせを確認した上で新プログラムへ切り換えるので、新プログラムが起動に失敗したときは現プログラムへの復旧が確実にこなえる。さらに、被インストール計算機には、復旧プログラムも一時記憶しておくので、入れ替えが失敗したときに直ちに復旧でき、当該計算機乃至システム稼働への悪影響を最小限に抑えることができる。

【0061】本実施形態では、予め新版と復旧版の記憶媒体を用意し、その確認処理と、新、旧プログラムのローディングを行なっている。これによらず、新プログラムへの切り換えが失敗した時に、新版と復旧版の記憶媒体の確認処理を行なって、復旧処理を行なうように変形することもできる。

【0062】〔実施形態3〕実施形態3は、実施形態1、2におけるインストール作業を実現するために必要な、外部記憶媒体の作成機能の実施例を説明する。インストール用外部記憶媒体101の作成は、図1に示した開発計算機114によって行なわれる。通常、開発計算機114はネットワーク103に接続されていない。しかし、ネットワーク103や他の通信手段を介して、インストール計算機102と情報を送受する構成、あるいは、開発計算機114とインストール計算機102を統合したシステム構成も可能である。

【0063】開発計算機114は、各計算機で稼働しているプログラムの名称とバージョン・レビジョンを管理

するインストール情報管理データベース115、開発したソフトウェア群116、インストール用外部記憶媒体作成部117を備えている。

【0064】図8に、インストール情報管理データベースのデータ構成を示す。インストール情報管理データベース115は、被インストール計算機のインストール番号フィールド1101、インストール番号に対応する計算機のホスト名称を格納する被インストール計算機名称フィールド1102、インストールの実行の度に付与されるバージョン・レビジョン番号を格納するバージョン・レビジョン番号格納フィールド1103を有している。インストール番号110101の場合では、作成済みバージョンV1.1～V1.3のうち、新バージョンのバージョン番号V1.3、復旧バージョン(現在、稼働中)のバージョン番号をV1.2で、相違のあるプログラム名称はBB.○、CC.○である。

【0065】開発計算機114は、バージョンアップまたはレビジョンアップの発生によって、そのプログラムの作成とテストを行ない、インストール情報管理データベース115に登録する。次に、インストール用外部記憶媒体作成部117によって、バージョンアップまたはレビジョンアップしたプログラムを含む新バージョン用外部記憶媒体と、対応する現在稼働中のプログラムを含む復旧バージョン用外部記憶媒体を作成する。

【0066】図9に、開発計算機によるインストール用外部記憶媒体の作成処理を示す。まず、作業者に被インストール計算機を選択要求を行なう(S501)。例えば、インストール情報管理データベース115に登録されている計算機名称を一覧表示し、この中から被インストール計算機を選択させる。

【0067】次に、選択された計算機のインストール番号、例えば「110101」をインストール情報管理データベース115から取り出し(S502)、現在作成済みのバージョンを表示し、その中からバージョンアップまたはレビジョンアップした最新バージョンを、新バージョン用外部記憶媒体のバージョン番号として選択するように要求する(S503)。同様に、復旧バージョン用外部記憶媒体のバージョン番号について、現在稼働中のバージョンを選択するように要求する(S504)。

【0068】次に、新バージョン番号と復旧バージョン番号で相違のあるプログラム名称を、作成済みのソフトウェア群116から抽出して表示し(S505)、相違のあるプログラムのうち、実際に入れ替えるプログラム名称の指定を要求する(S506)。または、相違のあるすべてのプログラムの入力を要求する。

【0069】次に、新バージョン用の外部記憶媒体101-1をセットし、インストールコマンド101a、インストール番号101b、自バージョン番号101d、対応媒体バージョン番号101e、メンバファイル10

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1 f、インストール対象プログラム101cを格納する(S507)。

【0070】続いて、復旧バージョン用の外部記憶媒体101-2をセットし、インストール番号101b、自バージョン番号101d、対応媒体バージョン番号101e、メンバファイル101f、インストール対象プログラム101cを格納する(S508)。

【0071】上記例の場合、新バージョン用外部記憶媒体へのインストール情報は、インストール番号:110101、自バージョン番号:V1.3、対応バージョン番号:V1.2、インストール対象プログラム:BB.o、CC.oとなる。また、復旧バージョン用外部記憶媒体へのインストール情報は、インストール番号:110101、自バージョン番号:V1.2、対応バージョン番号:V1.3、インストール対象プログラム:BB.o、CC.oとなる。

【0072】この2つの外部記憶媒体を用意して、実施形態1または2のインストール方式による、現地システムでのインストール作業が行なわれる。

【0073】なお、インストール情報管理データベース115に格納されるインストール番号と被インストール計算機名称は、インストール計算機102の被インストール計算機データベース110で管理されるそれと対応している。通常は、開発計算機114によるインストール情報の作成後、それらのデータがインストール計算機102にオンラインまたはオフラインで与えられる。

【0074】

【発明の効果】本発明によれば、インストールするソフトウェア(プログラム)とそのインストール先を示す被インストール計算機の識別情報(インストール番号)を一体的に管理し、インストールに際しその識別情報に基づいて、被インストール計算機の識別を行なうので、インストール先のミス指示やインストール用ソフトウェアの誤選択による、誤インストールを防止できる。

【0075】本発明によれば、インストール計算機とネットワークで結ばれた複数の被インストール計算機からなるシステムにおいて、インストールの際に外部記憶媒体から識別情報を抽出し、それを基に被インストール計算機の識別と確認を行なうので、分散配置された多数の計算機に対するインストール作業を簡単且つ、高信頼に実現できる。

【0076】上記発明において、被インストール計算機が記憶している前記確認情報は、前記識別情報を暗号化した情報であり、確認に際しては暗号化情報を復号化して行なうため、仮に被インストール計算機側で改竄されている場合は情報の不一致として検出されるので、システムの信頼性を向上できる。

【0077】本発明によれば、インストール用の新版と稼働中の現版(復旧版)のプログラムに対し、互いの対

応関係を示すバージョン情報(自バージョン、対応バージョン)を付与して一体的に管理しているので、インストールに先立ち、前記バージョン情報を読み出して両者が正しく対応しているか確認した上で、被インストール計算機へのインストールを行なう。従って、新版のプログラムへの切り替え結果が起動失敗の場合には、予め用意していた復旧のプログラに直ちに入れ替えしてシステムを復旧するので、対象計算機ないしシステムの稼働停止を最小限に抑えることができる。

10 【図面の簡単な説明】

【図1】本発明のインストール方式の一実施形態による計算機システムの構成図。

【図2】インストール用記憶媒体が格納するプログラムと管理情報のデータ構成図。

【図3】本発明のインストール方式の一実施形態で、インストール先の識別と確認の処理を示すフローチャート。

【図4】インストール計算機が管理する被インストール計算機データベースの内容と、インストール番号の暗号化を示す説明図。

20 【図5】インストール番号の暗号化及び復号化の処理を示すフローチャート。

【図6】一実施形態によるプログラムのインストール作業を示すフローチャート。

【図7】本発明のインストール方式の一実施形態で、新バージョン、復旧バージョンの外部記憶媒体の確認処理を示すフローチャート。

【図8】開発計算機におけるインストール情報管理データベースの記憶形式を示す説明図。

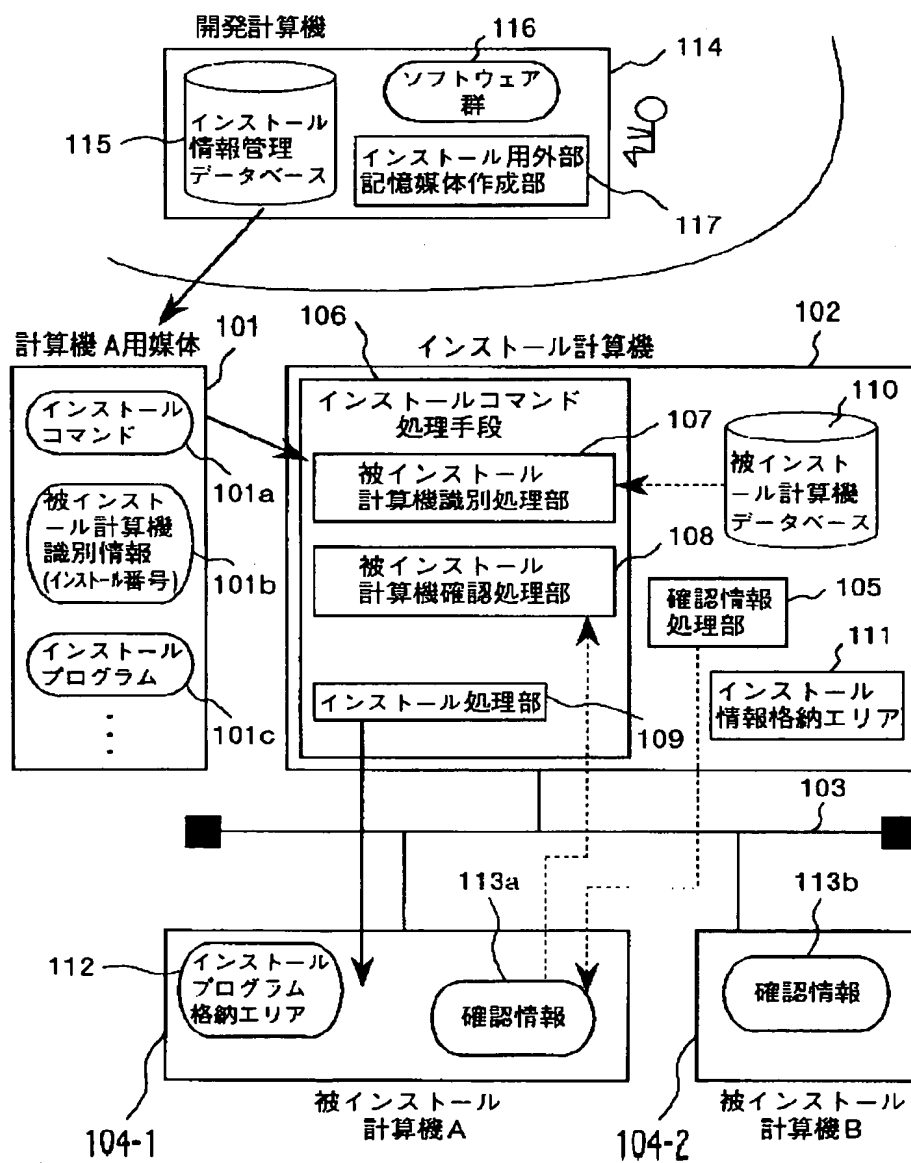
30 【図9】開発計算機によるインストール用記憶媒体の作成処理を示すフローチャート。

【符号の説明】

101…インストール用外部記憶媒体、101a…インストールコマンド、101b…インストール番号(被インストール計算機識別情報)、101c…インストールプログラム、101d…自バージョン番号、101e…対応媒体バージョン番号、102…インストール計算機、103…ネットワーク、104…被インストール計算機、105…確認情報処理部、106…インストールコマンド処理手段、107…被インストール計算機識別処理部、108…被インストール計算機確認処理部、109…インストール処理部、110…被インストール計算機データベース、111…インストール情報格納エリア、112…インストールプログラム格納エリア、113…確認情報格納エリア、114…開発計算機、115…インストール情報管理データベース、116…ソフトウェア群、117…インストール用外部記憶媒体作成部。

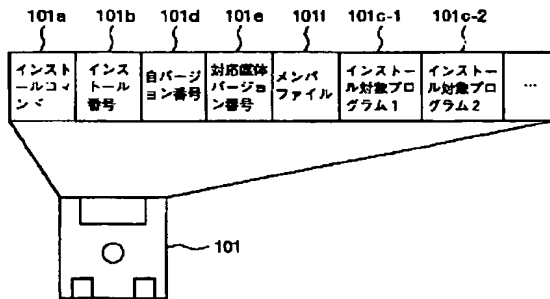
【図1】

図 1



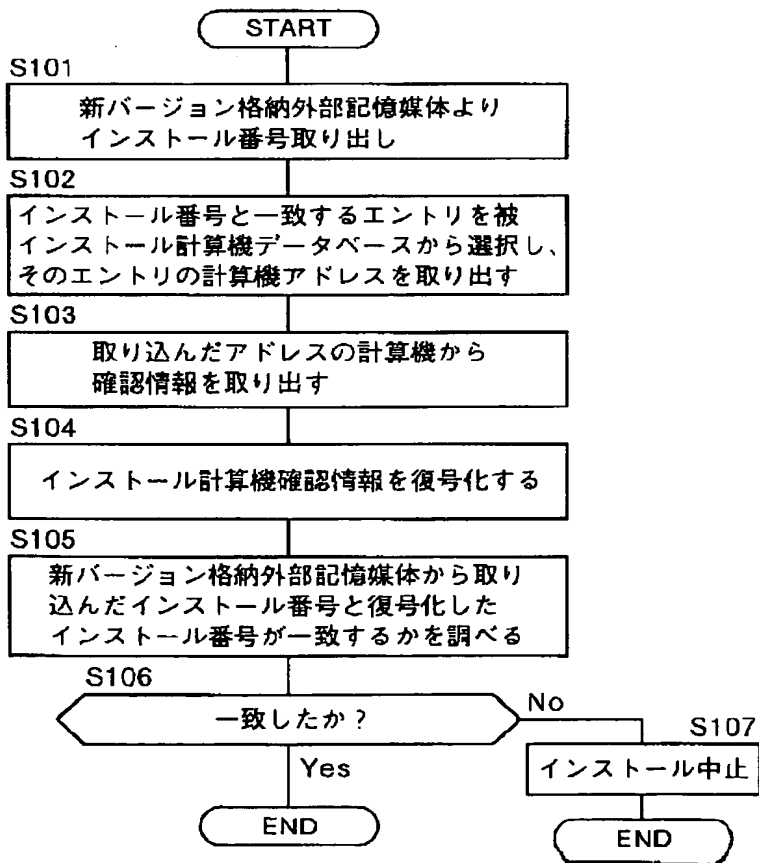
【図2】

図 2



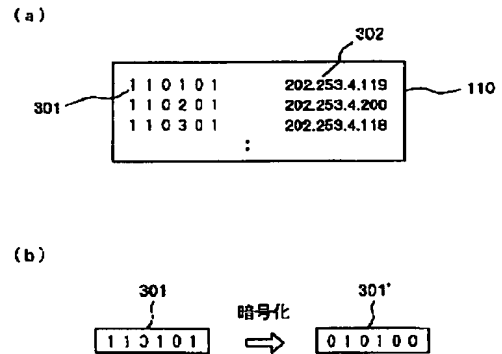
【図3】

図 3



【図4】

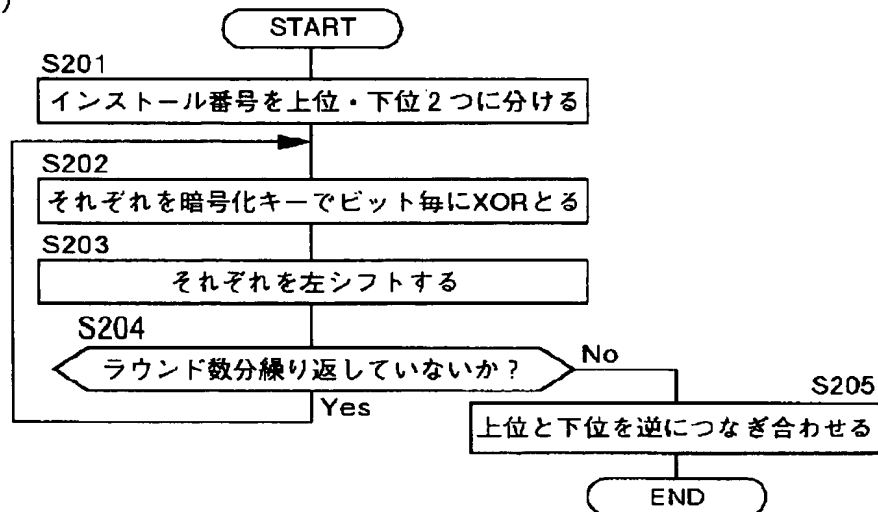
図 4



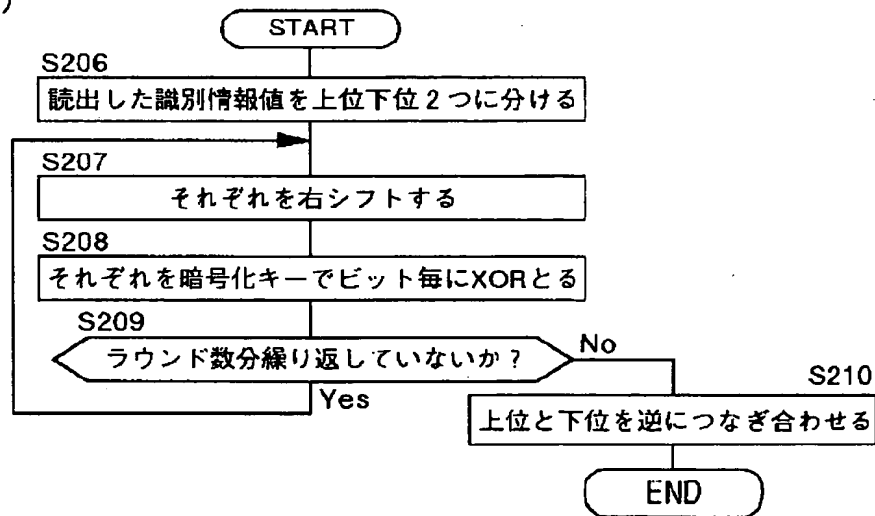
【図5】

図 5

(a)

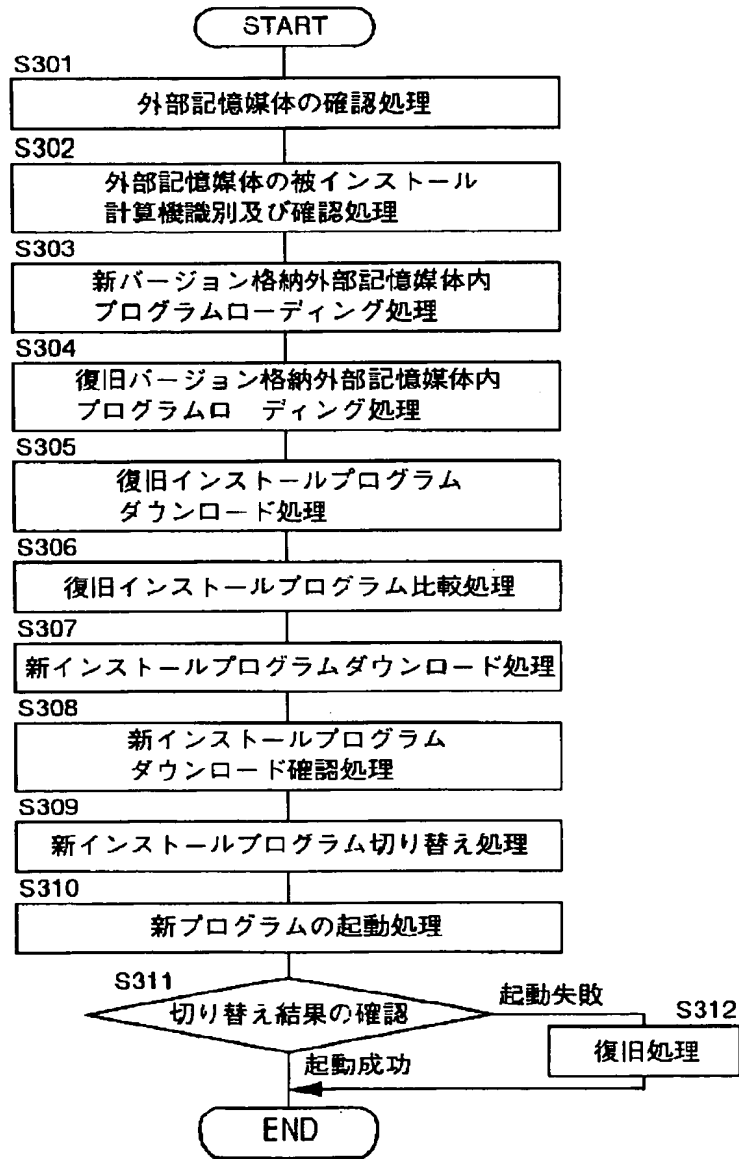


(b)



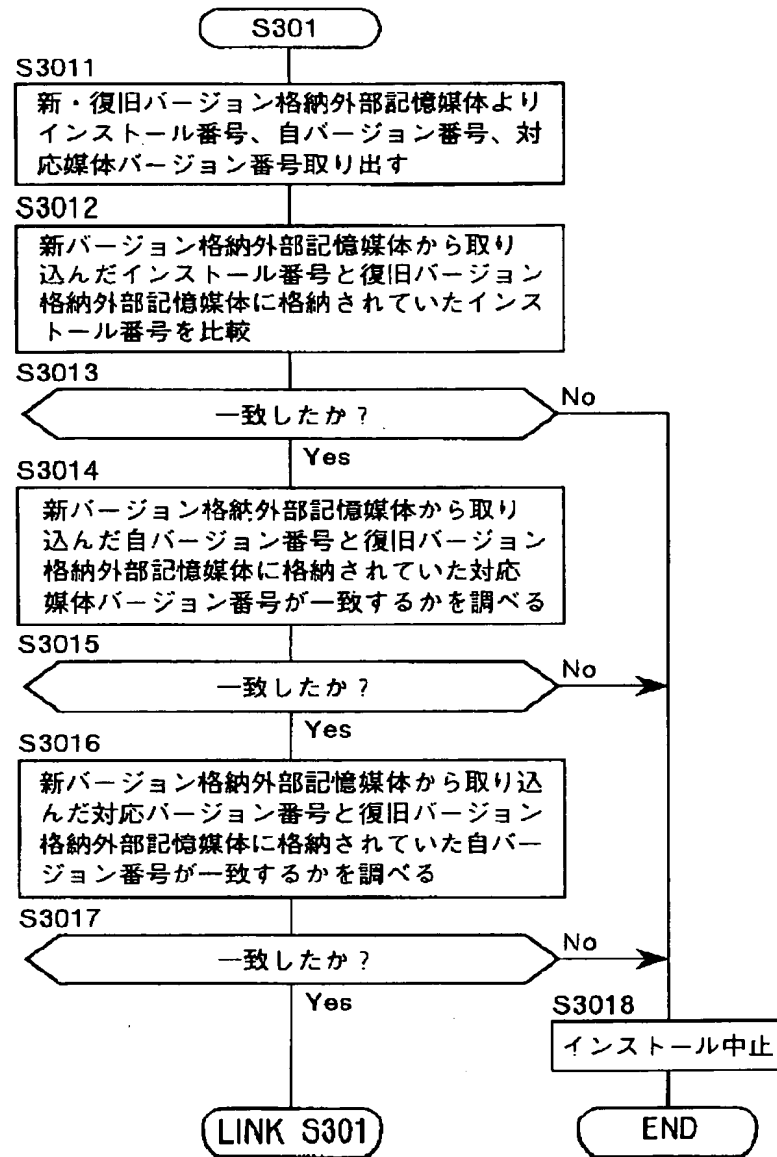
【図6】

図 6



【図7】

図 7



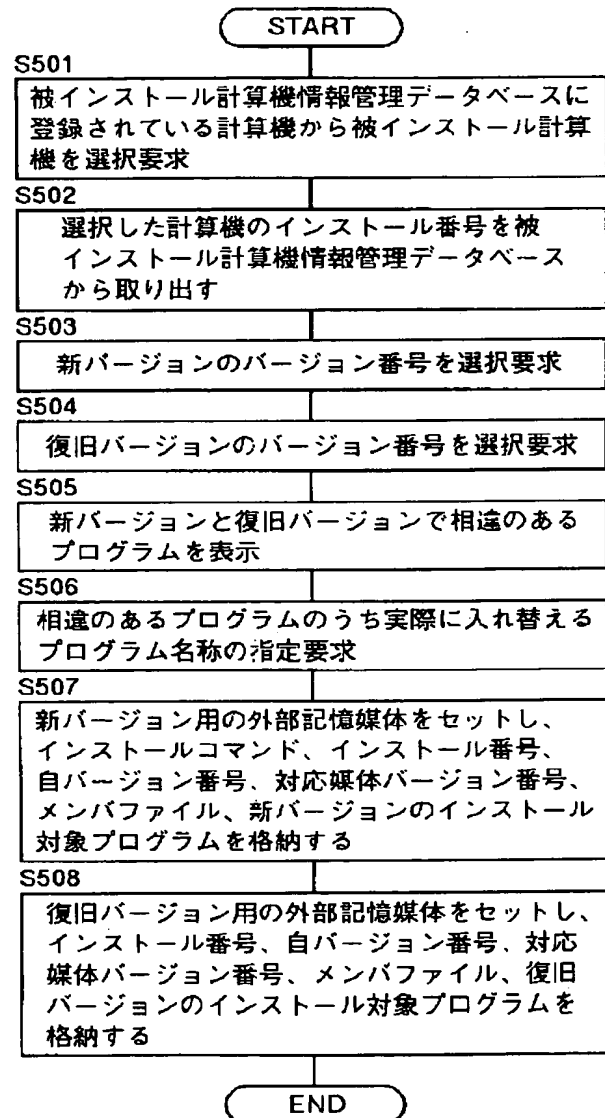
【図8】

図 8

115	1101	1102	1103	1104-a	1104-b	1105-c
10101	jkkd_A	V1.1	AA.o V1.1	BB.o V2.1	CC.o V1.2	
		V1.2	AA.o V1.1	BB.o V2.2	CC.o V1.3	
		V1.3	AA.o V1.1	BB.o V2.3	CC.o V1.4	
10201	jkkd_B	V1.2	AA.o V1.1	BB.o V2.1		
10301	jkkd_C	V1.1	AA.o V1.1	DD.o V2.1	CC.o V1.2	
		V1.2	AA.o V1.1	DD.o V2.1	CC.o V1.2	CC.o V1.2
	:					

【図9】

図 9



フロントページの続き

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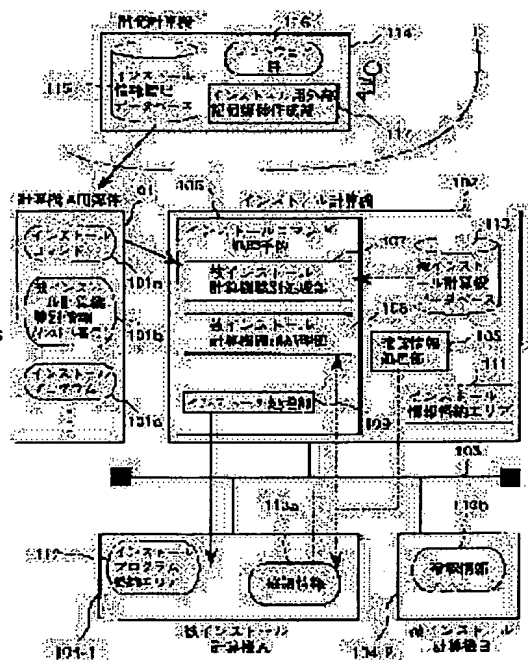
KIKUCHI KUNIYUKI

(54) INSTALLING METHOD FOR SOFTWARE AND ITS COMPUTER SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent software from being misinstalled by correctly identifying an object of installation among more than one computer.

SOLUTION: A storage medium 101 for installation is stored with an installation number 101b for identifying an installation destination. An installing computer 102 reads the installation number out of the storage medium 101 and takes the corresponding installation number and its computer address (network address) out of the installed computer data base 110 that the computer 102 itself controls. Then confirmation information 113a is read out of the computer having the address and when it matches the installation number 101b, a program 101c begins to be installed.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

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CLAIMS

[Claim]

[Claim 1] In the technique of specifying the target computer and installing software The identification information which indicates the installation place to be the aforementioned software to a meaning Manage (for example, an installation number) in one, and installation of the aforementioned software is faced. Take out the aforementioned identification information first and the installed computer corresponding to the identification information is discriminated. The installation technique of the software characterized by starting installation when the authentication information memorized beforehand is taken out from the address point of the computer and the aforementioned identification information and the aforementioned authentication information are in agreement.

[Claim 2] It is the installation technique of the software characterized by checking the correspondence with the identification information which is an information which enciphered the aforementioned identification information by which the aforementioned authentication information is set as the installed computer in the claim 1, and is managed in one with the aforementioned software through the decryption.

[Claim 3] In the computing system which is equipped with an installation computer and two or more installed computers tied with the network, and installs software in the target computer The aforementioned software and an installation information storage means to memorize in one the identification information (for example, installation number) which shows the installation place to a meaning, The installed computer database which manages the address of a corresponding installed computer for every aforementioned identification information, An authentication information storage means to memorize the authentication information which was included in the aforementioned installed computer and was set as each from the aforementioned installation computer, It is contained in the aforementioned installation computer and the identification information for installation is read from the aforementioned installation information storage means. The address of the installed computer managed by the same identification information as the identification information is extracted from the aforementioned installed computer database. An installed computer identification / authentication means to check the correspondence with the authentication information read from the installed computer of the address, and the concerned identification information, The computing system characterized by establishing an installation processing means to download the software memorized for the aforementioned installation information storage means when in agreement to the concerned installed computer.

[Claim 4] It is the computing system which the aforementioned installation information storage means consists of the external storage set to the aforementioned installation computer in case of installation in a claim 3, and is characterized by for the aforementioned installation computer reading the installation command stored in the aforementioned external storage, and realizing the function of the aforementioned installed computer identification / authentication means.

[Claim 5] In the installation technique of the software which specifies the target computer and replaces the software of the new edition containing the program which upgraded with the software of the present ** containing the program under operation The aforementioned software and the identification information which shows the installation place to a meaning (for example, installation number), The installation information containing the correspondence history information by the self-version and the correspondence version Have managed about the aforementioned new edition and the aforementioned present **, and installation of the aforementioned software is preceded. Each correspondence history information is read from the installation information on the aforementioned new edition and the aforementioned present **. The correspondence relation in which a mutual self-version turns into a partner's correspondence version is checked. Moreover, the installation technique of the software characterized by installing the software of the aforementioned new edition in the concerned installed computer after discriminating the installed computer which takes out the identification information of the aforementioned new edition and corresponds.

[Claim 6] It has an installation computer and two or more installed computers tied with the network. In the computing system constituted possible [exchange of the software of the new edition upgraded with the software of the present ** under operation of the target computer] The external storage for a new edition which stores the installation information containing the correspondence history information by the installation number and self-version which show the aforementioned software and its installation place to a meaning, and the correspondence version, The database which manages the address of the installed computer which corresponds for every aforementioned installation number, A means to check the identification information

which read the installation number from the aforementioned external storage for a new edition, discriminated the installed computer which corresponds from the aforementioned database, and was incorporated from the installed computer, The aforementioned installation computer possessing a means to install the aforementioned software in the installed computer by which the correspondence of an installation number and identification information was checked, A means to memorize the installation number enciphered as the aforementioned authentication information, It has the aforementioned installed computer possessing a means to store the installed software. The computing system characterized by constituting from an information on the external storage for installation so that an installed computer may be discriminated and checked and software may be installed.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed description]

[0001]

[The technical field to which invention belongs] this invention relates to the software installation formula of the distributed computer.

[0002]

[Prior art] As conventional software installation technique, the technique indicated by the publication-number 108317 [five to] official report is learned. In the example 4, in case two or more computers install a program in a specific computer in the system by which the network connection was carried out, in order to prevent incorrect installation to the computer outside an object, a host name is made to specify from an operator, the site number stored in the computer of the host name is incorporated to an installation computer, and identification of the computer for installation is realized by comparing with the site number in an offer medium.

[0003] Moreover, in the example 2 of the example of reference, the function returned to the status before program exchange after an installation end (restoration) is indicated. This function establishes an old program storage area in the computer for installation, and is realized by evacuating an old program there.

[0004]

[Object of the Invention] By the technique of the example 4 of the above-mentioned example of reference, unless an operator knows the host name of an installation place, installation work cannot be performed. Or installation work will go wrong if an operator mistakes the input of a host name.

[0005] Furthermore, there is a possibility that the site number of an alien machine may rewrite the site number of the file which stores the site number of the computer for installation by editor use, and the content of the file which stores a network address and a host name further can be rewritten. In this case, an installed computer will be mistaken even if it inputs the right host name.

[0006] Moreover, it is always necessary to secure the area which evacuates the old program by the technique of the example 2 of the above-mentioned example of reference. Moreover, the content of the program stored in an old program storage area may receive a breakdown and an alteration, and there is no assurance which can be restored certainly.

[0007] The purpose of this invention does not have a failure in the installation work by the operation mistake in view of the trouble of the conventional technique, and it is in offering a software installation formula certainly installable in the target computer, and the computing system which ties with a network two or more installed computers distributed with the installation computer.

[0008] The purpose of this invention is to offer the installation formula which stops installation and avoids incorrect installation, when the content in the offer medium used for exchange has a possibility that the alteration may be received.

[0009] The purpose of this invention ties with a network two or more installed computers distributed with the installation computer, and is to offer the computing system with the high reliability which applies the installation formula of this invention.

[0010] Other purposes of this invention are to offer the computing system certainly restored in the status before exchange, when it fails in activation of the replaced program.

[0011]

[The means for solving a technical problem] In the technique of the above-mentioned purpose specifying the target computer and installing software The identification information which indicates the installation place to be the aforementioned software to a meaning Manage (for example, an installation number) in one, and installation of the aforementioned software is faced. The aforementioned identification information is taken out first, the installed computer corresponding to the identification information is discriminated, and the authentication information memorized beforehand is taken out from the address point of the computer, and when the aforementioned identification information and the aforementioned authentication information are in agreement, it is attained by starting installation.

[0012] The aforementioned authentication information is an information which enciphered the aforementioned identification information set as the installed computer, and it is characterized by checking the correspondence with the identification information managed in one with the aforementioned software through the decryption.

[0013] In the computing system which the above-mentioned purpose is equipped with an installation computer and two or more installed computers tied with the network, and installs software in the target computer The aforementioned software and an installation information storage means to memorize in one the identification

information which shows the installation place to a meaning. The installed computer database which manages the address of a corresponding installed computer for every aforementioned identification information. An authentication information storage means to memorize the authentication information which was included in the aforementioned installed computer and was set as each from the aforementioned installation computer. It is contained in the aforementioned installation computer and the identification information for installation is read from the aforementioned installation information storage means. The address of the installed computer managed by the same identification information as the identification information is extracted from the aforementioned installed computer database. An installed computer identification / authentication means to check the correspondence with the authentication information read from the installed computer of the address, and the concerned identification information. When in agreement, it is attained by having established an installation processing means to download the software memorized for the aforementioned installation information storage means to the concerned installed computer.

[0014] The aforementioned installation information storage means consists of external storage, and is set to the aforementioned installation computer in case of installation. In addition, the installation computer is able to transmit an installation information from a development computer, without being based on external storage, or to serve as a development computer.

[0015] It is characterized by for the aforementioned installation computer reading the installation command stored in the aforementioned external storage, and realizing the function of the aforementioned installed computer identification / authentication means.

[0016] In the installation technique of the software which replaces the software of the new edition which other purposes of this invention specify the target computer, and includes the upgraded program with the software of the present ** containing the program under operation. The aforementioned software and the identification information which shows the installation place to a meaning. The installation information containing the correspondence history information by the self-version and the correspondence version. Have managed about the aforementioned new edition and the aforementioned present **, and installation of the aforementioned software is preceded. Each correspondence history information is read from the installation information on the aforementioned new edition and the aforementioned present **. The correspondence relation in which a mutual self-version turns into a partner's correspondence version is checked, and after discriminating the installed computer which takes out the identification information of the aforementioned new edition and corresponds, it is attained by installing the software of the aforementioned new edition in the concerned installed computer. In addition, not only the original update of a function but a revision rise of a partial revision is also included in the aforementioned upgrade.

[0017] When the activation by the software of the aforementioned new edition is performed and activation goes wrong after an end of the aforementioned installation, it is characterized by installing restoration by the software of the aforementioned present **.

[0018] Therefore, when the aforementioned correspondence relation is checked, the software of the aforementioned present ** is stored temporarily to an installation computer or an installed computer at a case and the activation by installation of the software of the aforementioned new edition goes wrong, it is characterized by restoring immediately by the software of the present ** stored temporarily.

[0019]

[Gestalt of implementation of invention] Hereafter, the enforcement gestalt of this invention is explained in detail through the enforcement gestalt 1-3.

[0020] The configuration of the computing system by one example of this invention is shown in [enforcement gestalt 1] drawing 1. This system consists of a network 103 which connects the installation computer 102 which manages installation of software, the installed computer 104-1, 104-2 which executes actual business with the installed software, and each [these] computer. In addition, the installation computer 102 is able to be used also [business / actual / an installation management and].

[0021] With this enforcement gestalt, the development computer 114 which focuses and performs the name management for discriminating a management of the version revision of software, a management of a change career, and a computer etc. is out of online, and the installation computer 102 incorporates a required information from the storage 101 of the software which is the result object of the development computer 114. Of course, the configuration whose installation computer 102 connect the development computer 114 to a network and incorporates an information on-line is also possible.

[0022] Especially this invention is suitable in the system by which many computers for installation are distributed. Although installation to installed computer A 104-1 will be explained below, installed computer B 104-2 etc. is the same also in the alien machine.

[0023] The development computer 114 has the installation information management database 115 and the software group 117 installed in an installed computer, and creates the storage 101 of the installation software of a creation of a source file or correction, its compilation, and exclusive use (here installed computer A) to every installed computer.

[0024] Installation command 101a, identification information (installation number) 101b of an installed computer, installation program 101c, etc. are stored in the storage A101 for installed computer A.

[0025] The data configuration of the external storage for installation is shown in drawing 2. the external storage for installation 101 — installation command 101a, installation number 101b, and the object for installation — program 101c-1, 101c-2 and ... are stored. Moreover, 101d [of self-version numbers].

correspondence medium version-number 101e, and member file 101f etc. is memorized. The content of these data differs for every installation object.

[0026] Installation command 101a determines an installed computer, it is for performing loading of a program, the down load to an installed computer, and a series of installation work called the change to a new program, and loading is carried out to an installation computer at the beginning of installation work.

[0027] An installation number is the identification information of an installed computer, and shows installed computer A which is the installation place of external storage A. When the installation number of external storage A and the installation number of installed computer A are in agreement, installation is performed to installed computer A.

[0028] program 101cfor installation- 1, 2, and .. are the programs of only a part required for the installed computer replaced by installation work Member file 101f, the name and size of the program for installation which are contained in a storage 101 are stored. About 101d of self-version numbers, and object ***** version-number 101e, it mentions later.

[0029] The installation computer 102 has the installation command-processing means 106 containing the installed computer identification processing section 107, the installed computer authentication processing section 108, and the installation processing section 109, the installed computer database 111, and the installation information storage area 112. Furthermore, the installation number 301 given to the computer with an entry is enciphered, and it has the authentication information-processing section 105 which generates authentication information 301' and stores it in the file of a corresponding computer.

[0030] The installed computer A104 has authentication information file 113a which memorizes authentication information 103' set up from the installation computer 102, and the installation program storage area 114 stored by installation operation. Incidentally, installed computer B 104-2 has authentication information file 113b which memorizes opportunity authentication information 103' for installed computer B.

[0031] Drawing 3 is a flow chart which shows identification of the installed computer by the installation computer, and processing of authentication. The installation computer 102 takes out installation command 101a from the external storage for installation A101. Subsequent processing is performed according to this installation command.

[0032] First, installation number 101b is taken out from a storage A101 to the ***** urinal stall information storage area 111 (S101), the entry which is in agreement with this installation number 101b is chosen from the installed computer database 110, and the computer address (network address) of the entry is taken out (S102). So far, it is carried out as a function of the installed computer identification processing section 107.

[0033] An installation number and the example of the encryption are indicated to be the data configurations of an installed computer database to drawing 4 . As shown in this drawing (a), in order to discriminate the computer which is carrying out the entry as an installed computer, the installation number 301 given to a meaning within the system and the network address 302 of the computer are registered into the installed computer database 110.

[0034] Next, the network address of the installed computer 104 which corresponded from the installation computer 102 is accessed, and authentication information 301' is read from authentication information file 113a of the installed computer 104 (S103). Authentication information 301' has enciphered and memorized the installation number 301 of the computer which is carrying out the entry to the installation computer 102, as shown in drawing 4 (b).

[0035] Then, authentication information 301' is decrypted (S104), and it compares whether it is in agreement with installation number 101b incorporated from the storage A101 (S105). The result of this comparison is checked (S106), if in agreement, the above installed computer authentication processing will be ended and installation of program 101c by the installation processing section 109 will be started. On the other hand, if the result is not in agreement, an error message is outputted and installation is stopped (S107).

[0036] An example of processing of encryption of an installation number and a decryption is shown in drawing 5 . The installation computer 102 enciphers the installation number 301 by the authentication information-processing section 105, and sets it as authentication information file 113a of computer A as authentication information 301' while it gives the installation number 301 to the installed computer database 110 and registers into it computer A which carries out the entry of the installation-ed.

[0037] As shown in the encryption processing flow of drawing 5 (a), an installation number, "110101", is divided into a high order "110" and low order "101" (S201), exclusive-OR XOR for every bit is taken by the encryption key of this digit about each numeric value (S202), and 1 bit shift of the result of an operation is carried out to the left, respectively (S203). [for example,] After repeating these S202 and S203 only several round minutes (S204), a high order and low order are connected conversely (S205).

[0038] Consequently, authentication information value 301' which the installation number 301 enciphered when "110101" encryption key was [100 and the number of rounds] 5 is set to "010100."

[0039] Next, decryption processing of an authentication information is explained. The installed computer authentication processing section 108 or the authentication information-processing section 105 called from there performs this processing. As shown in drawing 5 (b), a decryption is processed to encryption and the reverse sense. First, identification information value 301' "010100" read from authentication information file 113a is divided into a high order and low order (S206), and 1 bit shift of each is carried out to the right (S207). Next, XOR operation is performed for the shifted number-of-partitions value for every bit by the same encryption key as encryption processing (S208). This processing is repeated several round minutes (S209), and

the high order value and low order value which were calculated are connected conversely at the end (S210). 301' is restored for identification information to the installation number 301 before encryption by this.

[0040] As mentioned above, an installation number is uniquely defined within a system to the timing which adds an installed computer to this system, and is registered into the installed computer information management database 115 of the development computer 114. Encryption and a decryption of an installation number serve as the exclusive right matter of the installation computer 102 of managing a secret encryption key.

[0041] In case the development computer 114 publishes the storage 101 which stores the program developed or corrected to object computers, it takes out the installation number given to the object computer from the installed computer information management database 115, and memorizes it to the HDR of a storage 101.

[0042] Since the installation work to the concerned computer starts when installation precedes, the authentication information which read the installation number, took out the address of the computer corresponding to the installation number, accessed it from the storage which offers the program for installation, and read from the computer and which is enciphered decrypts according to this enforcement gestalt and it is in agreement with the installation number of a storage, authentication work of an installed computer can automate and incorrect installation by the operation mistake etc. can prevent.

[0043] Moreover, since the installation number stored in each computer can detect it by the installation computer side and takes the measures of incorrect installation prevention when an alteration occurs during processing by the side of an installed computer temporarily, since the enciphered authentication information was used, it can improve the reliability of a system.

[0044] The system configuration in the [enforcement gestalt 2] enforcement gestalt 2 and the data configuration of a storage are fundamentally [as the thing of drawing 1 explained with the enforcement gestalt 1, or drawing 2] the same. Below, the installation function by the installation computer is explained focusing on the difference with the enforcement gestalt 1.

[0045] The flow view of installation processing by the enforcement gestalt 2 is shown in drawing 6. First, the external storage of the right combination is prepared about external storage A 101-1 which stores the program of a new version, and external storage A 101-2 which stores the present version of an object computer as a restoration version, or authentication processing of external storage is performed (S301). This authentication work is performed by setting two storages, a new edition and the restoration version, to the installation computer 102, in order to prepare for the restoration at the time of failing in installation.

[0046] Here, 101d of self-version numbers shows the version revision number of the software group stored in the external storage for installation. Moreover, correspondence storage version-number 101e shows the version revision number of the concerned external storage and the external storage in a correspondence relation. Therefore, if the concerned external storage is a new version, the correspondence storage version-number 101e is the version revision number of a restoration version. On the contrary, if the concerned external storage is a restoration version, the correspondence storage version-number 101e is the version revision number of a new version.

[0047] Flowing of authentication processing of external storage is shown in drawing 7. First, from the new and old external storage for installation 101-1, 101-2, the installation computer 102 reads each installation number 101b, 101d of self-version numbers, and correspondence medium version-number 101e, respectively, and memorizes them to the installation information storage area 111 (S3011).

[0048] Next, installation number 101b-1 incorporated from the new version store external storage 101-1 is compared with installation number 101b-2 which were incorporated from the restoration version store external storage 101-2 (S3012). It checks whether both have been in agreement (S3013), and when not in agreement, an error message is outputted and installation is stopped (S3018).

[0049] when in agreement, it incorporated from the new version store external storage 101-1 — self— correspondence medium version-number 101e-2 incorporated from the restoration version store external storage 101-2 are compared with version-number 101c-1 (S3014), and it checks whether it is in agreement (S3015) When not in agreement, an error message is outputted and installation is stopped.

[0050] when in agreement, it incorporated from correspondence medium version-number 101e-1 incorporated from the new version store external storage 101-1, and the restoration version store external storage 101-2 — self— version-number 101c-2 are compared (S3016), and it checks whether it is in agreement (S3017) Consequently, since the right combination of the new version store external storage 101-1 and the restoration version store external storage 101-2 was checked when altogether in agreement, this authentication processing is ended. When not in agreement, the error message which shows that the combination of new and a restoration storage is unsuitable is outputted, and future installation processing is stopped.

[0051] After authentication of the external storage for installation of new and restoration is completed normally, it returns to processing of drawing 6 again, and identification of the installed computer 104 and authentication processing are performed using installation number 101b of new version store external storage A 101-1 (S302).

[0052] next, the work area for a new program of new version store external storage A 101-1 to the installation computer 102 — program 101c— for installation — loading of 1, 2, and ... is carried out (S303)

[0053] In addition, when the external storage for installation 101 is plurality, loading which sets external storage continuously is possible. That is, the size of the program of loading each on the basis of the name and size of the program for installation which have been memorized to member file 101f is checked, and authentication of whether loading of all the new programs was carried out correctly is performed.

[0054] Next, loading of the program for installation is carried out to the work area for a restoration program of the installation computer 102 from the restoration version store external storage 101-2 (S304). It checks by having carried out loading of the restoration program correctly also here, or measuring member file 101f.

[0055] Next, the program by which loading was carried out to the work area for a restoration program of an installation computer is downloaded to the work area for a restoration program of the installed computer 104 through a network 103 (S305).

[0056] Next, the downloaded program checks that it is the same as that of the program under operation by comparison of a program object by the installed computer 104 (S306).

[0057] Authentication of the identity of the downloaded restoration program and the program under operation of the installed computer 104 downloads a new program from the work area for a new program of the installation computer 102 to the work area for a new program of the installed computer 104 through a network (S307). Here, it checks by comparing the size of each program which the new program downloaded correctly or was downloaded (S308).

[0058] After being able to check a normal down load of a new program, the program which is working now is stopped and change processing for starting a new program is performed (S309). That is, the present program of the installation program storage area 114 is eliminated, and a new program is stored.

[0059] Next, activation processing of the installed computer 104 by the new program is performed (S310), and a switch result is checked to see it failed in whether activation was successful (S311). If activation of the installed computer 104 by the changed new program is successful, the program in the work area for an old program of an installed computer and the program in new and the work area for an old program in an installation computer will be eliminated, and installation operation will be ended. On the other hand, when activation goes wrong, it concludes that fault is in a new program, and shifts to restoration processing (S312). That is, activation is suspended, the new program of the installation program storage area 114 of an installed computer is eliminated, and the present program in the work area for an old program is stored.

[0060] Since it switches to a new program after according to this enforcement gestalt preparing the storage of a new edition and the restoration version and checking the right combination, when a new program fails in activation, restoration to the present program can be ensured. Furthermore, since the restoration program is also stored temporarily, to it, when exchange fails in an installed computer, it can restore immediately, and the bad influence to the concerned computer or system operation can be held down to the minimum extent to it.

[0061] With this enforcement gestalt, the storage of a new edition and the restoration version is prepared beforehand, and loading of the authentication processing, and a new and an old program is performed. When it is not based on this but the switch to a new program goes wrong, it can also deform so that authentication processing of the storage of a new edition and the restoration version may be performed and restoration processing may be performed.

[0062] The [enforcement gestalt 3] enforcement gestalt 3 explains the example of the creation function of external storage required in order to realize the installation work in the enforcement gestalt 1 and 2. A creation of the external storage for installation 101 is performed by the development computer 114 shown in drawing 1. Usually, the development computer 114 is not connected to the network 103. However, the configuration which sends and receives the installation computer 102 and an information through a network 103 or other means of communications, or the system configuration which unified the development computer 114 and the installation computer 102 is also possible.

[0063] The development computer 114 is equipped with the installation information management database 115 which manages the name and version revision of the program which is working by each computer, the developed software group 116, and the external storage creation section for installation 117.

[0064] The data configuration of an installation information management database is shown in drawing 8. The installation information management database 115 has the installation number field 1101 of an installed computer, the installed computer name field 1102 which stores the host name of the computer corresponding to an installation number, and the version revision number store field 1103 which stores the version revision number given to the degree of execution of installation. In the case of the installation number 110101, the program names which are V1.2 and have a difference in the version number V1.3 of a new version and the version number of a restoration version (under present and operation) are BB.o and CC.o among the created versions V1.1-V1.3.

[0065] By occurrence of upgrade or a revision rise, the development computer 114 performs a creation and test of the program, and registers them into the installation information management database 115. Next, the external storage for new versions which includes the program which carried out upgrade or the revision rise by the external storage creation section for installation 117, and the external storage for restoration versions containing the program under corresponding present operation are created.

[0066] Creation processing of the external storage for installation by the development computer is shown in drawing 9. First, a selection demand of an installed computer is given to an operator (S501). For example, an installed computer is made to choose from a chart example and this inside the computer name registered into the installation information management database 115.

[0067] Next, the installation number of the selected computer, "110101", is taken out from the installation information management database 115 (S502), a version [finishing / the present creation] is displayed, and the latest version which carried out upgrade or the revision rise out of it is required as choosing as a version number of the external storage for new versions (S503). / for example, Similarly, it is required that the version

under present operation is chosen about the version number of the external storage for restoration versions (S504).

[0068] Next, by the new version number and the restoration version number, the program name with a difference is extracted from the software group [finishing / a creation] 116, and is displayed (S505), and specification of the program name actually replaced among the programs with a difference is demanded (S506). Or the input of all the programs with a difference is demanded.

[0069] Next, the external storage 101-1 for new versions is set, and installation command 101a, installation number 101b, 101d [of self-version numbers], correspondence medium version-number 101e, and member file 101f and program 101c for installation are stored (S507).

[0070] Then, the external storage 101-2 for restoration versions is set, and installation number 101b, 101d [of self-version numbers], correspondence medium version-number 101e, and member file 101f and program 101c for installation are stored (S508).

[0071] the case of the above-mentioned example — the installation information on the external storage for new versions — installation number:110101 — self — it is set to version-number:V1.3, correspondence version-number:V1.2, program:BB.o for installation, and CC.o moreover, the installation information on the external storage for restoration versions — installation number:110101 — self — it is set to version-number:V1.2, correspondence version-number:V1.3, program:BB.o for installation, and CC.o

[0072] These two external storage is prepared and installation work by the local system by the installation formula of the enforcement gestalt 1 or 2 is performed.

[0073] In addition, the installation number and installed computer name which are stored in the installation information management database 115 correspond with it which is managed in the installed computer database 110 of the installation computer 102. Usually, those data are given to the installation computer 102 online or off-line after a creation of the installation information by the development computer 114.

[0074]

[Effect of the invention] Since according to this invention the identification information (installation number) of an installed computer which shows the software (program) to install and its installation place is managed in one and an installed computer is discriminated in case of installation based on the identification information, mistake designation of an installation place and incorrect installation by the false drop of the software for installation can be prevented.

[0075] Since according to this invention identification information is extracted from external storage in the case of installation and identification and authentication of an installed computer are performed on the basis of it in the system which consists of two or more installed computers connected with the network to the installation computer, the installation work to the computer of the distributed masses is realizable for easy and high reliance.

[0076] In the above-mentioned invention, the aforementioned authentication information which the installed computer has memorized is an information which enciphered the aforementioned identification information, and since it is detected as an information being inharmonious when temporarily altered by the installed computer side in order to carry out by decrypting an encryption information in case of authentication, it can improve the reliability of a system.

[0077] Since according to this invention the version information (a self-version, correspondence version) which shows a mutual correspondence relation was given to the program of the new edition for installation, and the present ** under operation (the restoration version) and it had managed in one, after checking whether installation is preceded, the aforementioned version information is read and both correspond surely, installation to an installed computer is performed. Therefore, since it changes to ***** of the restoration currently prepared beforehand immediately and a system is restored when the change result to the program of a new edition is an activation failure, an operation halt of an object computer or a system can be suppressed to the minimum extent.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the software installation formula of the distributed computer.

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PRIOR ART

[Prior art] As conventional software installation technique, the technique indicated by the publication-number 108317 [five to] official report is learned. In the example 4, in case two or more computers install a program in a specific computer in the system by which the network connection was carried out, in order to prevent incorrect installation to the computer outside an object, a host name is made to specify from an operator, the site number stored in the computer of the host name is incorporated to an installation computer, and identification of the computer for installation is realized by comparing with the site number in an offer medium. [0003] Moreover, in the example 2 of the example of reference, the function returned to the status before program exchange after an installation end (restoration) is indicated. This function establishes an old program storage area in the computer for installation, and is realized by evacuating an old program there.

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EFFECT OF THE INVENTION

[Effect of the invention] Since according to this invention the identification information (installation number) of an installed computer which shows the software (program) to install and its installation place is managed in one and an installed computer is discriminated in case of installation based on the identification information, mistake designation of an installation place and incorrect installation by the false drop of the software for installation can be prevented.

[0075] Since according to this invention identification information is extracted from external storage in the case of installation and identification and authentication of an installed computer are performed on the basis of it in the system which consists of two or more installed computers connected with the network to the installation computer, the installation work to the computer of the distributed masses is realizable for easy and high reliance.

[0076] In the above-mentioned invention, the aforementioned authentication information which the installed computer has memorized is an information which enciphered the aforementioned identification information, and since it is detected as an information being inharmonious when temporarily altered by the installed computer side in order to carry out by decrypting an encryption information in case of authentication, it can improve the reliability of a system.

[0077] Since according to this invention the version information (a self-version, correspondence version) which shows a mutual correspondence relation was given to the program of the new edition for installation, and the present ** under operation (the restoration version) and it had managed in one, after checking whether installation is preceded, the aforementioned version information is read and both correspond surely, installation to an installed computer is performed. Therefore, since it changes to ***** of the restoration currently prepared beforehand immediately and a system is restored when the change result to the program of a new edition is an activation failure, an operation halt of an object computer or a system can be suppressed to the minimum extent.

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TECHNICAL PROBLEM

[Object of the Invention] By the technique of the example 4 of the above-mentioned example of reference, unless an operator knows the host name of an installation place, installation work cannot be performed. Or installation work will go wrong if an operator mistakes the input of a host name.

[0005] Furthermore, there is a possibility that the site number of an alien machine may rewrite the site number of the file which stores the site number of the computer for installation by editor use, and the content of the file which stores a network address and a host name further can be rewritten. In this case, an installed computer will be mistaken even if it inputs the right host name.

[0006] Moreover, it is always necessary to secure the area which evacuates the old program by the technique of the example 2 of the above-mentioned example of reference. Moreover, the content of the program stored in an old program storage area may receive a breakdown and an alteration, and there is no assurance which can be restored certainly.

[0007] The purpose of this invention does not have a failure in the installation work by the operation mistake in view of the trouble of the conventional technique, and it is in offering a software installation formula certainly installable in the target computer, and the computing system which ties with a network two or more installed computers distributed with the installation computer.

[0008] The purpose of this invention is to offer the installation formula which stops installation and avoids incorrect installation, when the content in the offer medium used for exchange has a possibility that the alteration may be received.

[0009] The purpose of this invention ties with a network two or more installed computers distributed with the installation computer, and is to offer the computing system with the high reliability which applies the installation formula of this invention.

[0010] Other purposes of this invention are to offer the computing system certainly restored in the status before exchange, when it fails in activation of the replaced program.

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MEANS

[The means for solving a technical problem] In the technique of the above-mentioned purpose specifying the target computer and installing software The identification information which indicates the installation place to be the aforementioned software to a meaning Manage (for example, an installation number) in one, and installation of the aforementioned software is faced. The aforementioned identification information is taken out first, the installed computer corresponding to the identification information is discriminated, and the authentication information memorized beforehand is taken out from the address point of the computer, and when the aforementioned identification information and the aforementioned authentication information are in agreement, it is attained by starting installation.

[0012] The aforementioned authentication information is an information which enciphered the aforementioned identification information set as the installed computer, and it is characterized by checking the correspondence with the identification information managed in one with the aforementioned software through the decryption.

[0013] In the computing system which the above-mentioned purpose is equipped with an installation computer and two or more installed computers tied with the network, and installs software in the target computer The aforementioned software and an installation information storage means to memorize in one the identification information which shows the installation place to a meaning. The installed computer database which manages the address of a corresponding installed computer for every aforementioned identification information, An authentication information storage means to memorize the authentication information which was included in the aforementioned installed computer and was set as each from the aforementioned installation computer. It is contained in the aforementioned installation computer and the identification information for installation is read from the aforementioned installation information storage means. The address of the installed computer managed by the same identification information as the identification information is extracted from the aforementioned installed computer database. An installed computer identification / authentication means to check the correspondence with the authentication information read from the installed computer of the address, and the concerned identification information, When in agreement, it is attained by having established an installation processing means to download the software memorized for the aforementioned installation information storage means to the concerned installed computer.

[0014] The aforementioned installation information storage means consists of external storage, and is set to the aforementioned installation computer in case of installation. In addition, the installation computer is able to transmit an installation information from a development computer, without being based on external storage, or to serve as a development computer.

[0015] It is characterized by for the aforementioned installation computer reading the installation command stored in the aforementioned external storage, and realizing the function of the aforementioned installed computer identification / authentication means.

[0016] In the installation technique of the software which replaces the software of the new edition which other purposes of this invention specify the target computer, and includes the upgraded program with the software of the present ** containing the program under operation The aforementioned software and the identification information which shows the installation place to a meaning. The installation information containing the correspondence history information by the self-version and the correspondence version Have managed about the aforementioned new edition and the aforementioned present **, and installation of the aforementioned software is preceded. Each correspondence history information is read from the installation information on the aforementioned new edition and the aforementioned present **. The correspondence relation in which a mutual self-version turns into a partner's correspondence version is checked, and after discriminating the installed computer which takes out the identification information of the aforementioned new edition and corresponds, it is attained by installing the software of the aforementioned new edition in the concerned installed computer. In addition, not only the original update of a function but a revision rise of a partial revision is also included in the aforementioned upgrade.

[0017] When the activation by the software of the aforementioned new edition is performed and activation goes wrong after an end of the aforementioned installation, it is characterized by installing restoration by the software of the aforementioned present **.

[0018] Therefore, when the aforementioned correspondence relation is checked, the software of the aforementioned present ** is stored temporarily to an installation computer or an installed computer at a case and the activation by installation of the software of the aforementioned new edition goes wrong, it is characterized by restoring immediately by the software of the present ** stored temporarily.

[0019]

[Gestalt of implementation of invention] Hereafter, the enforcement gestalt of this invention is explained in detail through the enforcement gestalt 1-3.

[0020] The configuration of the computing system by one example of this invention is shown in [enforcement gestalt 1] drawing 1. This system consists of a network 103 which connects the installation computer 102 which manages installation of software, the installed computer 104-1, 104-2 which executes actual business with the installed software, and each [these] computer. In addition, the installation computer 102 is able to be used also [business / actual / an installation management and].

[0021] With this enforcement gestalt, the development computer 114 which focuses and performs the name management for discriminating a management of the version revision of software, a management of a change career, and a computer etc. is out of online, and the installation computer 102 incorporates a required information from the storage 101 of the software which is the result object of the development computer 114. Of course, the configuration whose installation computer 102 connect the development computer 114 to a network and incorporates an information on-line is also possible.

[0022] Especially this invention is suitable in the system by which many computers for installation are distributed. Although installation to installed computer A 104-1 will be explained below, installed computer B 104-2 etc. is the same also in the alien machine.

[0023] The development computer 114 has the installation information management database 115 and the software group 117 installed in an installed computer, and creates the storage 101 of the installation software of a creation of a source file or correction, its compilation, and exclusive use (here installed computer A) to every installed computer.

[0024] Installation command 101a, identification information (installation number) 101b of an installed computer, installation program 101c, etc. are stored in the storage A101 for installed computer A.

[0025] The data configuration of the external storage for installation is shown in drawing 2. the external storage for installation 101 — installation command 101a, installation number 101b, and the object for installation — program 101c-1, 101c-2 and ... are stored. Moreover, 101d [of self-version numbers], correspondence medium version-number 101e, and member file 101f etc. is memorized. The content of these data differs for every installation object.

[0026] Installation command 101a determines an installed computer, it is for performing loading of a program, the down load to an installed computer, and a series of installation work called the change to a new program, and loading is carried out to an installation computer at the beginning of installation work.

[0027] An installation number is the identification information of an installed computer, and shows installed computer A which is the installation place of external storage A. When the installation number of external storage A and the installation number of installed computer A are in agreement, installation is performed to installed computer A.

[0028] program 101c for installation- 1, 2, and .. are the programs of only a part required for the installed computer replaced by installation work. Member file 101f, the name and size of the program for installation which are contained in a storage 101 are stored. About 101d of self-version numbers, and object ***** version-number 101e, it mentions later.

[0029] The installation computer 102 has the installation command-processing means 106 containing the installed computer identification processing section 107, the installed computer authentication processing section 108, and the installation processing section 109, the installed computer database 111, and the installation information storage area 112. Furthermore, the installation number 301 given to the computer with an entry is enciphered, and it has the authentication information-processing section 105 which generates authentication information 301' and stores it in the file of a corresponding computer.

[0030] The installed computer A104 has authentication information file 113a which memorizes authentication information 103' set up from the installation computer 102, and the installation program storage area 114 stored by installation operation. Incidentally, installed computer B 104-2 has authentication information file 113b which memorizes opportunity authentication information 103' for installed computer B.

[0031] Drawing 3 is a flow chart which shows identification of the installed computer by the installation computer, and processing of authentication. The installation computer 102 takes out installation command 101a from the external storage for installation A101. Subsequent processing is performed according to this installation command.

[0032] First, installation number 101b is taken out from a storage A101 to the ***** urinal stall information storage area 111 (S101), the entry which is in agreement with this installation number 101b is chosen from the installed computer database 110, and the computer address (network address) of the entry is taken out (S102). So far, it is carried out as a function of the installed computer identification processing section 107.

[0033] An installation number and the example of the encryption are indicated to be the data configurations of an installed computer database to drawing 4. As shown in this drawing (a), in order to discriminate the computer which is carrying out the entry as an installed computer, the installation number 301 given to a meaning within the system and the network address 302 of the computer are registered into the installed computer database 110.

[0034] Next, the network address of the installed computer 104 which corresponded from the installation computer 102 is accessed, and authentication information 301' is read from authentication information file 113a of the installed computer 104 (S103). Authentication information 301' has enciphered and memorized the

installation number 301 of the computer which is carrying out the entry to the installation computer 102, as shown in drawing 4 (b).

[0035] Then, authentication information 301' is decrypted (S104), and it compares whether it is in agreement with installation number 101b incorporated from the storage A101 (S105). The result of this comparison is checked (S106), if in agreement, the above installed computer authentication processing will be ended and installation of program 101c by the installation processing section 109 will be started. On the other hand, if the result is not in agreement, an error message is outputted and installation is stopped (S107).

[0036] An example of processing of encryption of an installation number and a decryption is shown in drawing 5. The installation computer 102 enciphers the installation number 301 by the authentication information-processing section 105, and sets it as authentication information file 113a of computer A as authentication information 301' while it gives the installation number 301 to the installed computer database 110 and registers into it computer A which carries out the entry of the installation-ed.

[0037] As shown in the encryption processing flow of drawing 5 (a), an installation number, "110101", is divided into a high order "110" and low order "101" (S201), exclusive-OR XOR for every bit is taken by the encryption key of this digit about each numeric value (S202), and 1 bit shift of the result of an operation is carried out to the left, respectively (S203). [for example,] After repeating these S202 and S203 only several round minutes (S204), a high order and low order are connected conversely (S205).

[0038] Consequently, authentication information value 301' which the installation number 301 enciphered when "110101" encryption key was [100 and the number of rounds] 5 is set to "010100."

[0039] Next, decryption processing of an authentication information is explained. The installed computer authentication processing section 108 or the authentication information-processing section 105 called from there performs this processing. As shown in drawing 5 (b), a decryption is processed to encryption and the reverse sense. First, identification information value 301' "010100" read from authentication information file 113a is divided into a high order and low order (S206), and 1 bit shift of each is carried out to the right (S207). Next, XOR operation is performed for the shifted number-of-partitions value for every bit by the same encryption key as encryption processing (S208). This processing is repeated several round minutes (S209), and the high order value and low order value which were calculated are connected conversely at the end (S210). 301' is restored for identification information to the installation number 301 before encryption by this.

[0040] As mentioned above, an installation number is uniquely defined within a system to the timing which adds an installed computer to this system, and is registered into the installed computer information management database 115 of the development computer 114. Encryption and a decryption of an installation number serve as the exclusive right matter of the installation computer 102 of managing a secret encryption key.

[0041] In case the development computer 114 publishes the storage 101 which stores the program developed or corrected to object computers, it takes out the installation number given to the object computer from the installed computer information management database 115, and memorizes it to the HDR of a storage 101.

[0042] Since the installation work to the concerned computer starts when installation precedes, the authentication information which read the installation number, took out the address of the computer corresponding to the installation number, accessed it from the storage which offers the program for installation, and read from the computer and which is enciphered decrypts according to this enforcement gestalt and it is in agreement with the installation number of a storage, authentication work of an installed computer can automate and incorrect installation by the operation mistake etc. can prevent.

[0043] Moreover, since the installation number stored in each computer can detect it by the installation computer side and takes the measures of incorrect installation prevention when an alteration occurs during processing by the side of an installed computer temporarily, since the enciphered authentication information was used, it can improve the reliability of a system.

[0044] The system configuration in the [enforcement gestalt 2] enforcement gestalt 2 and the data configuration of a storage are fundamentally [as the thing of drawing 1 explained with the enforcement gestalt 1, or drawing 2] the same. Below, the installation function by the installation computer is explained focusing on the difference with the enforcement gestalt 1.

[0045] The flow view of installation processing by the enforcement gestalt 2 is shown in drawing 6. First, the external storage of the right combination is prepared about external storage A 101-1 which stores the program of a new version, and external storage A 101-2 which stores the present version of an object computer as a restoration version, or authentication processing of external storage is performed (S301). This authentication work is performed by setting two storages, a new edition and the restoration version, to the installation computer 102, in order to prepare for the restoration at the time of failing in installation.

[0046] Here, 101d of self-version numbers shows the version revision number of the software group stored in the external storage for installation. Moreover, correspondence storage version-number 101e shows the version revision number of the concerned external storage and the external storage in a correspondence relation. Therefore, if the concerned external storage is a new version, the correspondence storage version-number 101e is the version revision number of a restoration version. On the contrary, if the concerned external storage is a restoration version, the correspondence storage version-number 101e is the version revision number of a new version.

[0047] Flowing of authentication processing of external storage is shown in drawing 7. First, from the new and old external storage for installation 101-1, 101-2, the installation computer 102 reads each installation number 101b, 101d of self-version numbers, and correspondence medium version-number 101e, respectively, and

memorizes them to the installation information storage area 111 (S3011).

[0048] Next, installation number 101b-1 incorporated from the new version store external storage 101-1 is compared with installation number 101b-2 which were incorporated from the restoration version store external storage 101-2 (S3012). It checks whether both have been in agreement (S3013), and when not in agreement, an error message is outputted and installation is stopped (S3018).

[0049] when in agreement, it incorporated from the new version store external storage 101-1 — self — correspondence medium version-number 101e-2 incorporated from the restoration version store external storage 101-2 are compared with version-number 101c-1 (S3014), and it checks whether it is in agreement (S3015). When not in agreement, an error message is outputted and installation is stopped.

[0050] when in agreement, it incorporated from correspondence medium version-number 101e-1 incorporated from the new version store external storage 101-1, and the restoration version store external storage 101-2 — self — version-number 101c-2 are compared (S3016), and it checks whether it is in agreement (S3017).

Consequently, since the right combination of the new version store external storage 101-1 and the restoration version store external storage 101-2 was checked when altogether in agreement, this authentication processing is ended. When not in agreement, the error message which shows that the combination of new and a restoration storage is unsuitable is outputted, and future installation processing is stopped.

[0051] After authentication of the external storage for installation of new and restoration is completed normally, it returns to processing of drawing 6 again, and identification of the installed computer 104 and authentication processing are performed using installation number 101b of new version store external storage A 101-1 (S302). This processing becomes the same as that of S101-S106 which were explained with the enforcement gestalt 1.

[0052] next, the work area for a new program of new version store external storage A 101-1 to the installation computer 102 — program 101c — for installation — loading of 1, 2, and ... is carried out (S303).

[0053] In addition, when the external storage for installation 101 is plurality, loading which sets external storage continuously is possible. That is, the size of the program of loading each on the basis of the name and size of the program for installation which have been memorized to member file 101f is checked, and authentication of whether loading of all the new programs was carried out correctly is performed.

[0054] Next, loading of the program for installation is carried out to the work area for a restoration program of the installation computer 102 from the restoration version store external storage 101-2 (S304). It checks by having carried out loading of the restoration program correctly also here, or measuring member file 101f.

[0055] Next, the program by which loading was carried out to the work area for a restoration program of an installation computer is downloaded to the work area for a restoration program of the installed computer 104 through a network 103 (S305).

[0056] Next, the downloaded program checks that it is the same as that of the program under operation by comparison of a program object by the installed computer 104 (S306).

[0057] Authentication of the identity of the downloaded restoration program and the program under operation of the installed computer 104 downloads a new program from the work area for a new program of the installation computer 102 to the work area for a new program of the installed computer 104 through a network (S307). Here, it checks by comparing the size of each program which the new program downloaded correctly or was downloaded (S308).

[0058] After being able to check a normal down load of a new program, the program which is working now is stopped and change processing for starting a new program is performed (S309). That is, the present program of the installation program storage area 114 is eliminated, and a new program is stored.

[0059] Next, activation processing of the installed computer 104 by the new program is performed (S310), and a switch result is checked to see it failed in whether activation was successful (S311). If activation of the installed computer 104 by the changed new program is successful, the program in the work area for an old program of an installed computer and the program in new and the work area for an old program in an installation computer will be eliminated, and installation operation will be ended. On the other hand, when activation goes wrong, it concludes that fault is in a new program, and shifts to restoration processing (S312). That is, activation is suspended, the new program of the installation program storage area 114 of an installed computer is eliminated, and the present program in the work area for an old program is stored.

[0060] Since it switches to a new program after according to this enforcement gestalt preparing the storage of a new edition and the restoration version and checking the right combination, when a new program fails in activation, restoration to the present program can be ensured. Furthermore, since the restoration program is also stored temporarily, to it, when exchange fails in an installed computer, it can restore immediately, and the bad influence to the concerned computer or system operation can be held down to the minimum extent to it.

[0061] With this enforcement gestalt, the storage of a new edition and the restoration version is prepared beforehand, and loading of the authentication processing, and a new and an old program is performed. When it is not based on this but the switch to a new program goes wrong, it can also deform so that authentication processing of the storage of a new edition and the restoration version may be performed and restoration processing may be performed.

[0062] The [enforcement gestalt 3] enforcement gestalt 3 explains the example of the creation function of external storage required in order to realize the installation work in the enforcement gestalt 1 and 2. A creation of the external storage for installation 101 is performed by the development computer 114 shown in drawing 1. Usually, the development computer 114 is not connected to the network 103. However, the configuration which sends and receives the installation computer 102 and an information through a network 103 or other means of

communications, or the system configuration which unified the development computer 114 and the installation computer 102 is also possible.

[0063] The development computer 114 is equipped with the installation information management database 115 which manages the name and version revision of the program which is working by each computer, the developed software group 116, and the external storage creation section for installation 117.

[0064] The data configuration of an installation information management database is shown in drawing 8. The installation information management database 115 has the installation number field 1101 of an installed computer, the installed computer name field 1102 which stores the host name of the computer corresponding to an installation number, and the version revision number store field 1103 which stores the version revision number given to the degree of execution of installation. In the case of the installation number 110101, the program names which are V1.2 and have a difference in the version number V1.3 of a new version and the version number of a restoration version (under present and operation) are BB.o and CC.o among the created versions V1.1-V1.3.

[0065] By occurrence of upgrade or a revision rise, the development computer 114 performs a creation and test of the program, and registers them into the installation information management database 115. Next, the external storage for new versions which includes the program which carried out upgrade or the revision rise by the external storage creation section for installation 117, and the external storage for restoration versions containing the program under corresponding present operation are created.

[0066] Creation processing of the external storage for installation by the development computer is shown in drawing 9. First, a selection demand of an installed computer is given to an operator (S501). For example, an installed computer is made to choose from a chart example and this inside the computer name registered into the installation information management database 115.

[0067] Next, the installation number of the selected computer, "110101", is taken out from the installation information management database 115 (S502), a version [finishing / the present creation] is displayed; and the latest version which carried out upgrade or the revision rise out of it is required as choosing as a version number of the external storage for new versions (S503). / for example, Similarly, it is required that the version under present operation is chosen about the version number of the external storage for restoration versions (S504).

[0068] Next, by the new version number and the restoration version number, the program name with a difference is extracted from the software group [finishing / a creation] 116, and is displayed (S505), and specification of the program name actually replaced among the programs with a difference is demanded (S506). Or the input of all the programs with a difference is demanded.

[0069] Next, the external storage 101-1 for new versions is set, and installation command 101a, installation number 101b, 101d [of self-version numbers], correspondence medium version-number 101e, and member file 101f and program 101c for installation are stored (S507).

[0070] Then, the external storage 101-2 for restoration versions is set, and installation number 101b, 101d [of self-version numbers], correspondence medium version-number 101e, and member file 101f and program 101c for installation are stored (S508).

[0071] the case of the above-mentioned example — the installation information on the external storage for new versions — installation number:110101 — self— it is set to version-number:V1.3, correspondence version-number:V1.2, program:BB.o for installation, and CC.o moreover, the installation information on the external storage for restoration versions — installation number:110101 — self— it is set to version-number:V1.2, correspondence version-number:V1.3, program:BB.o for installation, and CC.o

[0072] These two external storage is prepared and installation work by the local system by the installation formula of the enforcement gestalt 1 or 2 is performed.

[0073] In addition, the installation number and installed computer name which are stored in the installation information management database 115 correspond with it which is managed in the installed computer database 110 of the installation computer 102. Usually, those data are given to the installation computer 102 online or off-line after a creation of the installation information by the development computer 114.

[Translation done.]

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[An easy explanation of a drawing]

[Drawing 1] The block diagram of the computing system by the 1 enforcement gestalt of the installation formula of this invention.

[Drawing 2] The data block diagram of a program and management information which the storage for installation stores.

[Drawing 3] The flow chart which shows identification of an installation place, and processing of authentication with the 1 enforcement gestalt of the installation formula of this invention.

[Drawing 4] Explanatory drawing showing the content of the installed computer database which an installation computer manages, and encryption of an installation number.

[Drawing 5] The flow chart which shows processing of encryption of an installation number, and a decryption.

[Drawing 6] The flow chart which shows installation work of the program by the 1 enforcement gestalt.

[Drawing 7] The flow chart which shows authentication processing of the external storage of a new version and a restoration version with the 1 enforcement gestalt of the installation formula of this invention.

[Drawing 8] Explanatory drawing showing the storage format of the installation information management database in a development computer.

[Drawing 9] The flow chart which shows creation processing of the storage for installation by the development computer.

[An explanation of a sign]

101 — The external storage for installation, 101a — Installation command, 101b — An installation number (installed computer identification information), 101c — Installation program, 101d — A self-version number, 101e — Correspondence medium version number, 102 [— An installed computer,] — An installation computer, 103 — A network, 104 105 — The authentication information-processing section, 106 — Installation command-processing means, 107 — The installed computer identification processing section, 108 — Installed computer authentication processing section, 109 — The installation processing section, 110 — Installed computer database, 111 [— An authentication information storage area, 114 / — A development computer, 115 / — An installation information management database, 116 / — A software group, 117 / — The external storage creation section for installation.] — An installation information storage area, 112 — An installation program storage area, 113

[Translation done.]

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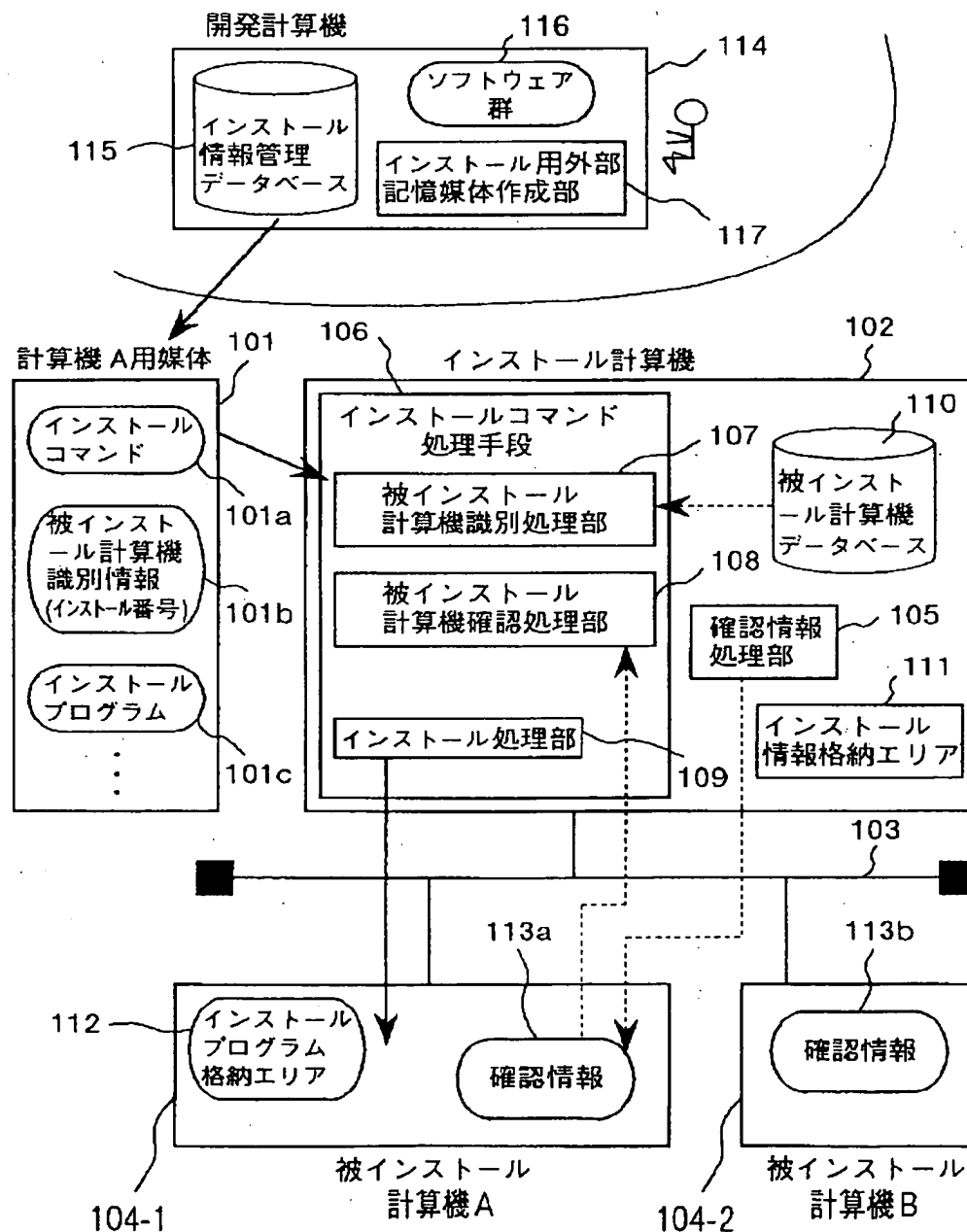
2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DRAWINGS

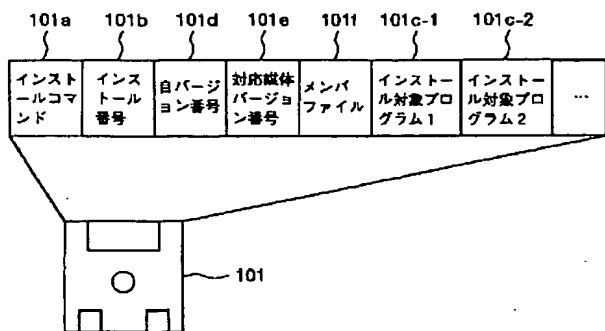
[Drawing 1]

図 1



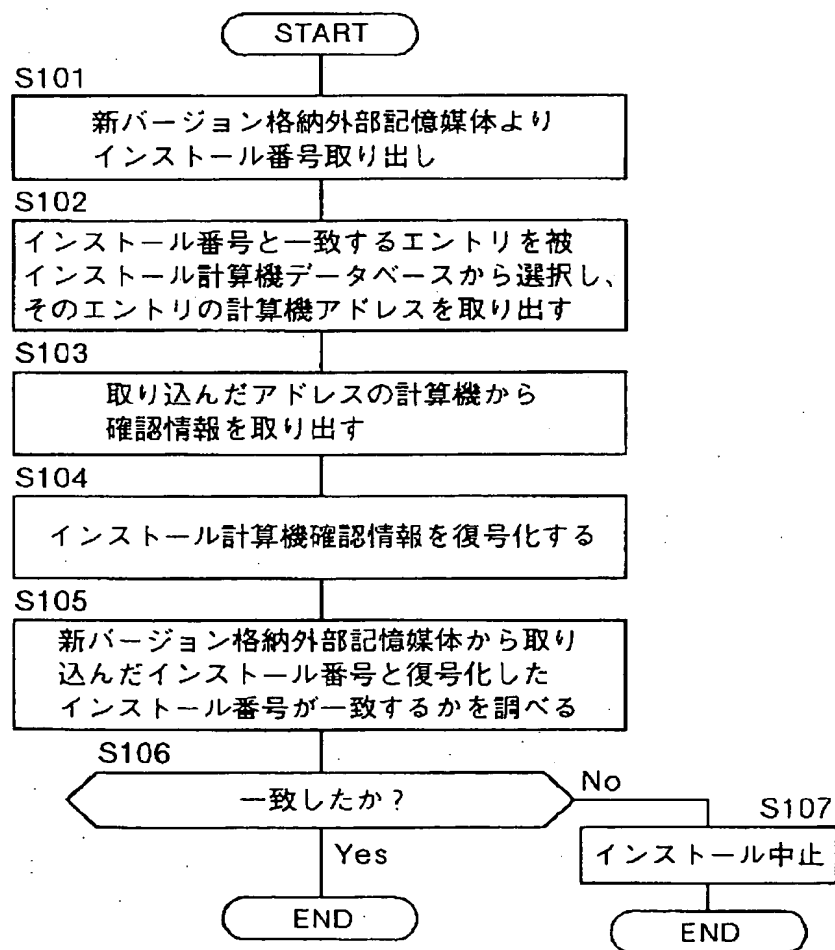
[Drawing 2]

図 2



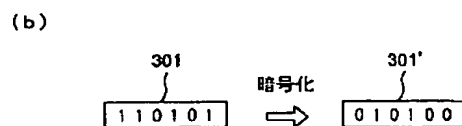
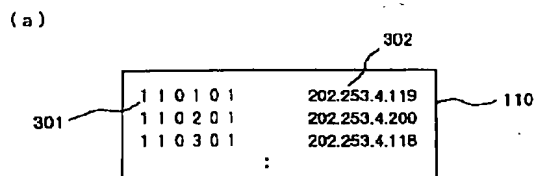
[Drawing 3]

図 3



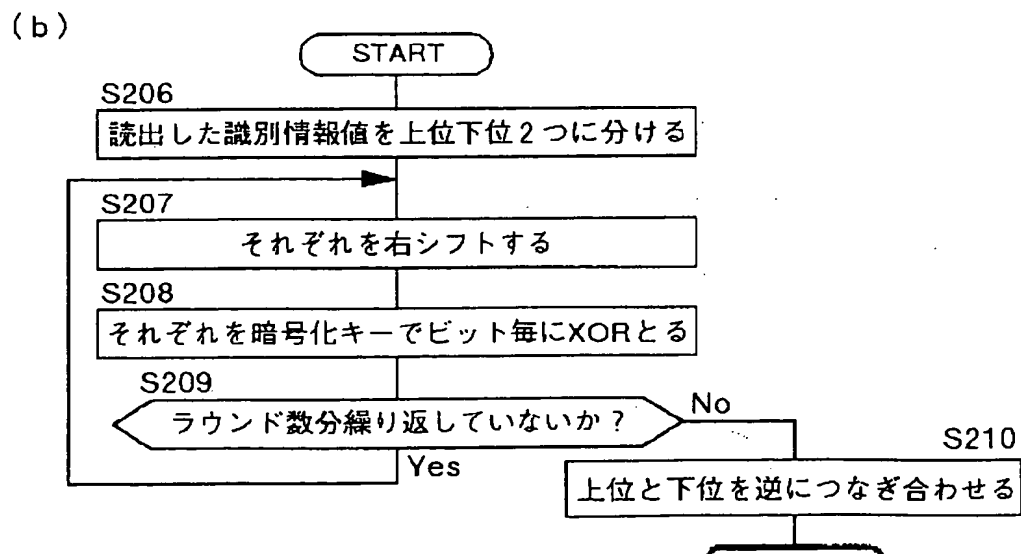
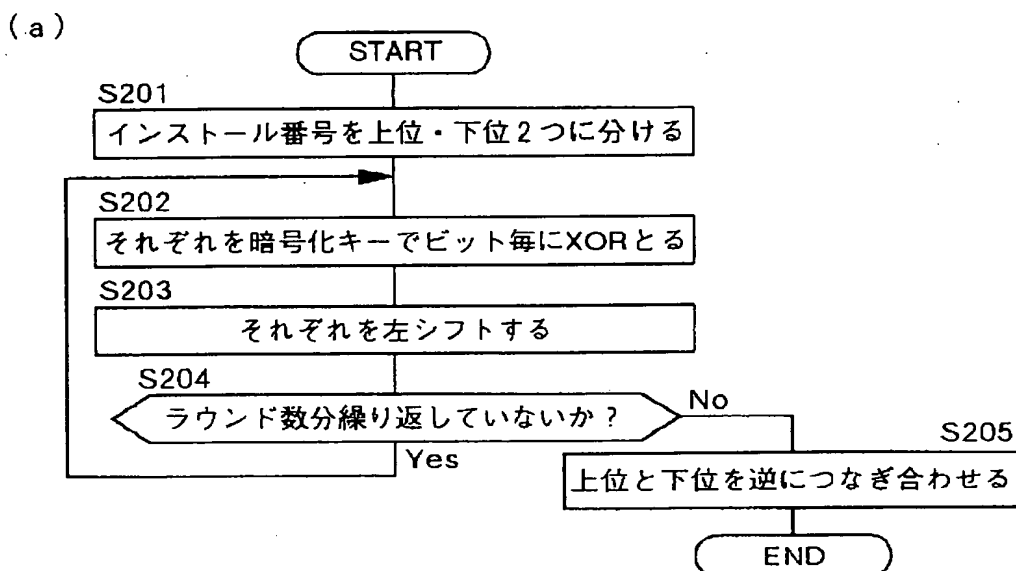
[Drawing 4]

図 4



[Drawing 5]

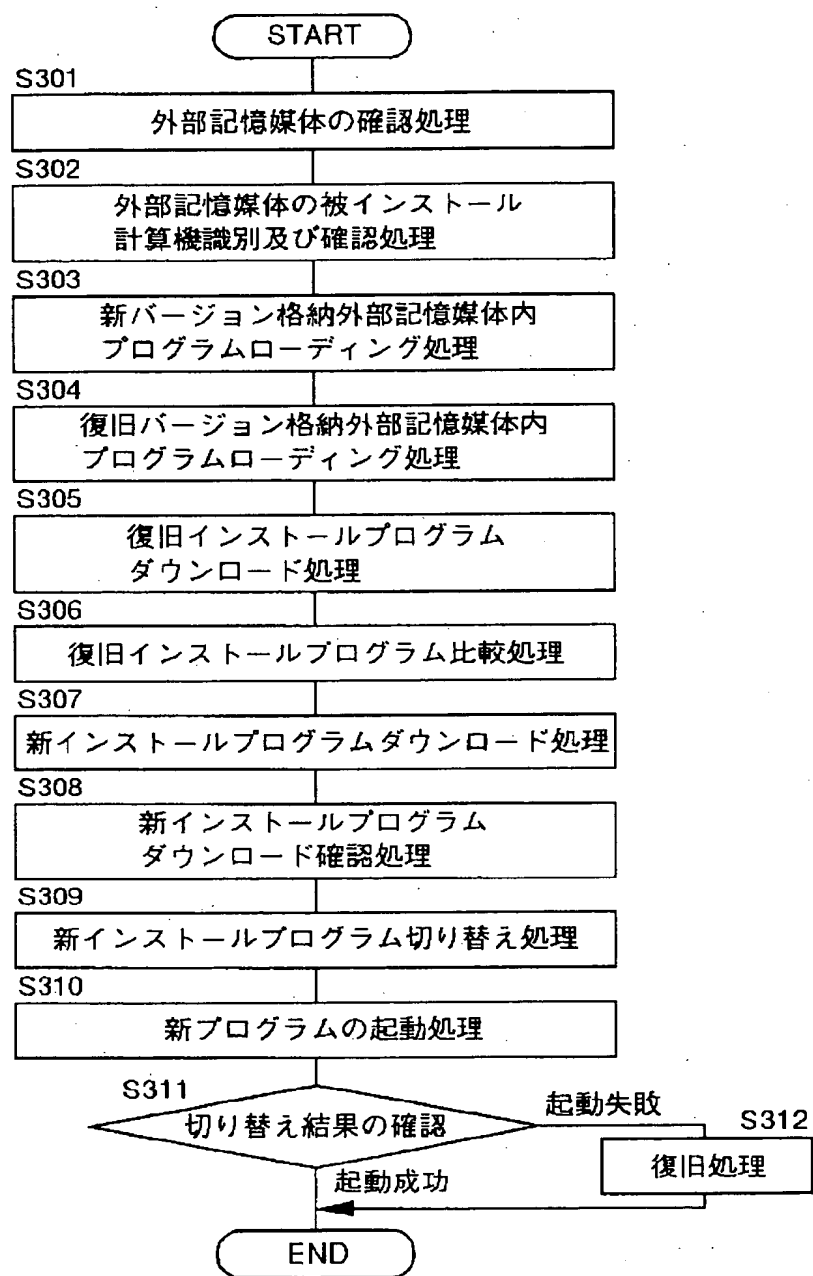
図 5



END

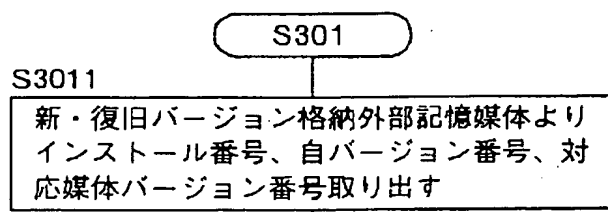
[Drawing 6]

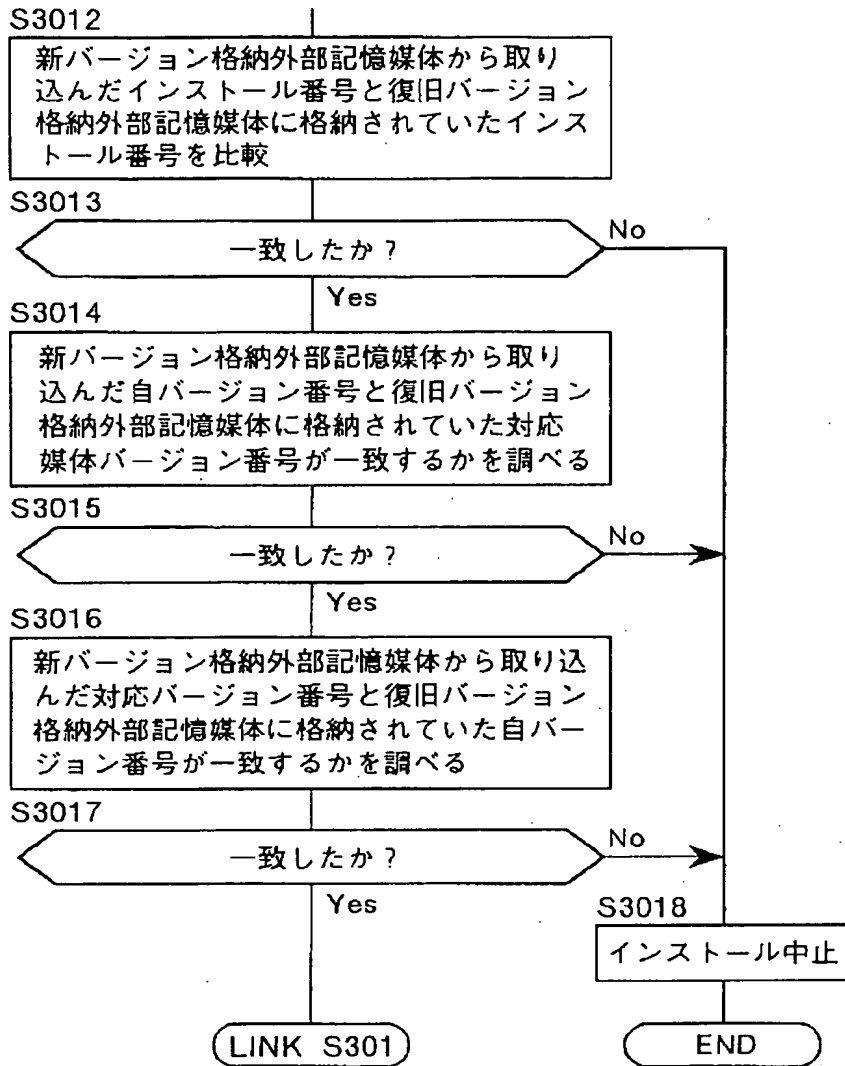
図 6



[Drawing 7]

図 7





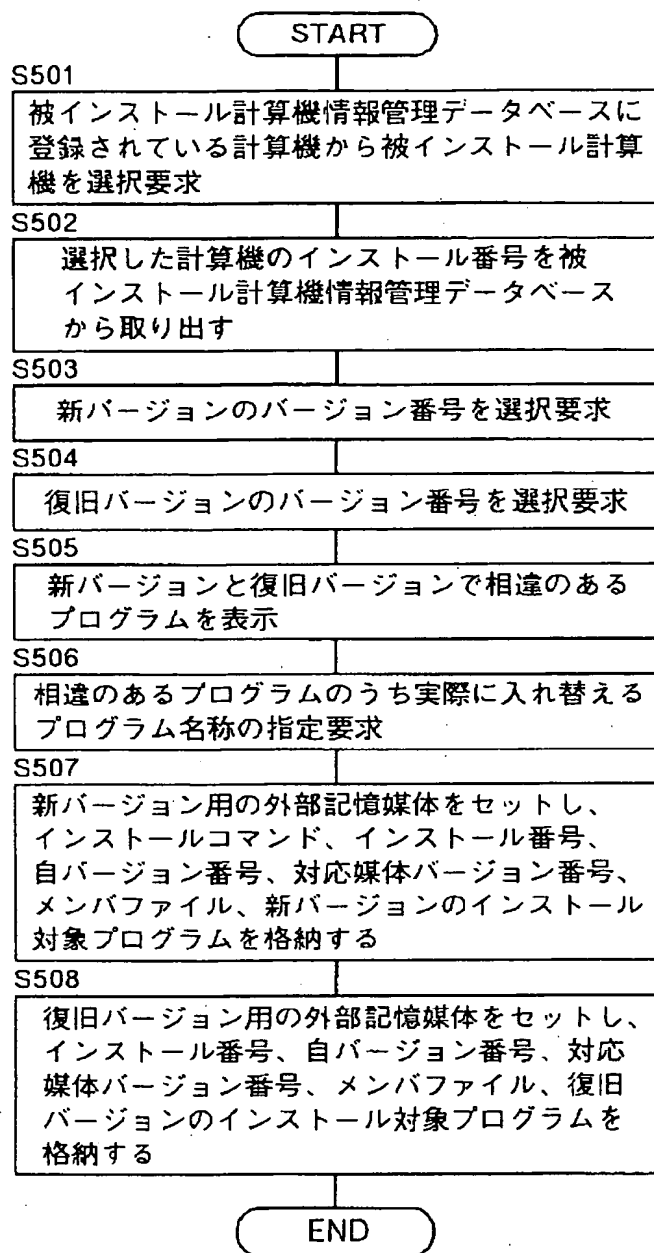
[Drawing 8]

図 8

115	1101	1102	1103	1104-a	1104-b	1105-c
1 1 0 1 0 1	jkkk A	V1.1	AA.o	BB.o	CC.o	
			V1.1	V2.1	V1.2	
			V1.2	AA.o	BB.o	CC.o
			V1.1	V2.2	V1.3	
			V1.3	AA.o	BB.o	CC.o
			V1.1	V2.3	V1.4	
1 1 0 2 0 1	jkkk_B	V1.2	AA.o	BB.o		
			V1.1	V2.1		
1 1 0 3 0 1	jkkk C	V1.1	AA.o	DD.o	CC.o	
			V1.1	V2.1	V1.2	
			V1.2	AA.o	DD.o	CC.o
			V1.1	V2.1	V1.2	CC.o
						V1.2
	:					

[Drawing 9]

図 9



[Translation done.]